Vol. 936 Number 2

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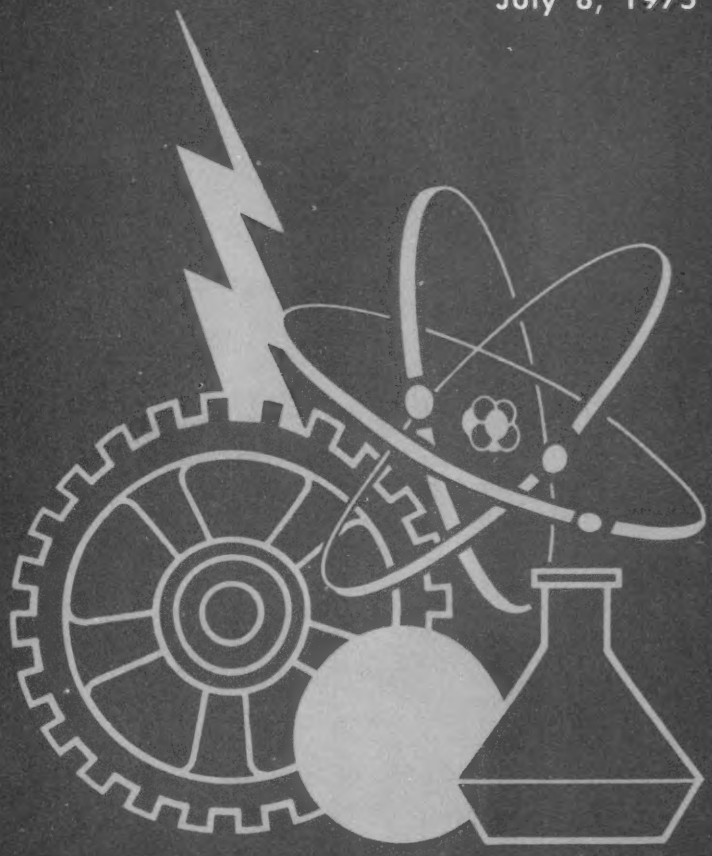

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July 8, 1975 Volume 936 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

3,217,867, R. I. Harris, PACKAGE FOR DISPLAYING ELONGATED ARTICLES; **3,470,638,** Friedman, Harris, Mauch, Harris and Manzo, WATCH BAND CONSTRUCTION, **filed** Jan. 1, 1970, D.C., S.D.N.Y., Doc. 70–23, *Brite Industries Inc.* v. *Westerman Manufacturing Co., Inc.* Consent judgment, defendant permanently restrained and enjoined from further infringement of the U.S. patents except by leave or license of plaintiff, Feb. 22, 1973.

3,232,761, Allen and Burness, HARDENING OF PHOTOGRAPHIC GELATIN LAYERS; **Re. 26,601,** same, **filed** Feb. 24, 1975, D.C., S.D.N.Y., Doc. 75–C–925, *Eastman Kodak Company* v. *GAF Corporation.*

3,285,621, S. Turner, Jr., WHEELED VEHICLE SUSPENSION, **filed** Feb. 21, 1975, D.C., N.D. Ohio (Toledo), Doc. 75–71, *TWM Manufacturing Company, Inc.* v. *Sycon Corporation et al.*

3,298,378, Stevens, Schweitzer and Selke, METHOD OF MAKING A TOBACCO PRODUCT, **filed** July 28, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c1848, *Sylgab Steel and Wire Corporation* v. *Imoco-Gateway Corp.* Patent invalid and unenforceable and thus the defendants have not infringed the patent as alleged in Court, Feb. 12, 1975.

3,305,536, P. Warner, POLYSULFIDE POLYMERS, **filed** Feb. 18, 1975, D.C., S.D. Calif. (San Diego), Doc. 75–0096–T, *Johnson & Johnson and Dispersalloy Inc.* v. *Gary Weikel.*

3,333,280, Hynek, Russell and Ainslie, INTERLINER, **filed** May 3, 1974, D.C., N.D. Ga. (Atlanta), Doc. C–74–871 A, *Johnson & Johnson* v. *DHJ Industries, Inc.* U.S. patent good and valid and has been infringed by defendant. Defendant's counterclaims are dismissed with prejudice. No other relief is granted and plaintiff's claims are withdrawn with prejudice, Feb. 25, 1975.

3,337,212, Barker, Nickerson and Rumball, WORK GUIDANCE MECHANISMS; **3,604,707,** F. A. Hurley, ELECTRIC DART GAME AND THE LIKE, **filed** Apr. 9, 1973, D.C. Pa. (Philadelphia), Doc. 73–820, *Funtronics of Texas Inc.* v. *Tri-City Inc.* Consent decree, ordered that the complaint and counterclaim are dismissed with prejudice, Feb. 11, 1975.

3,458,314, Linowitizki and Kramer, PROCESS AND DEVICE FOR DEVELOPING A TWO-COMPONENT DIAZOTYPE MATERIAL, **filed** Feb. 11, 1975, D.C., N.D. Calif. (San Francisco), Doc. C–75–0304LHB, *Geni-Chlor International Inc.* v. *Multisonics Development Corp.*

3,470,638. (See 3,217,867.)

3,483,523, Cogar, Sekse, Banziger, Ming and Horvath, DATA RECORDING AND VERIFYING MACHINE, **filed** Aug. 18, 1970, D.C., S.D.N.Y., Doc. 70–3584, *Mohawk Data Sciences Corp.* v. *Honeywell Inc.* Stipulation of dismissal under Rule 41(a)(1)(ii) F.R.C.P., dismissing action, including the counterclaim, without prejudice, Feb. 7, 1975.

3,604,707. (See 3,337,212.)

3,632,138, W. P. Whitley, Jr., IMMERSIBLE BOAT TRAILER WITH BOAT CRADLING AND LATCHING MEANS, **filed** Feb. 14, 1975, D.C., N.D. Fla. (Tampa), Doc. 75–122–C–T.H., *Southeastern Fabricators Inc. et al.* v. *Edward G. Boettcher et al.*

3,633,774, W. S. Lee, MOVING METHOD; **3,809,261,** same, **filed** Nov. 11, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c3240, *William S. Lee and Lee Moving and Storage* v. *Michael Bartnett and Neptune World-Wide Moving, Inc.*

3,725,158, Schmidt, Heyman and Johnsen, MULTICOMPONENT POWDERLESS ETCHING BATH ADDITIVE; **3,725,159,** same, POWDERLESS ETCHING BATH COMPOSITIONS, **filed** Nov. 5, 1973, D.C.N.J. (Newark), Doc. 1596–73, *Mona Industries, Inc.* v. *Philip A. Hunt Chemical Corporation.* Stipulation and order dismissing complaint and counterclaim, Feb. 20, 1975.

3,725,159. (See 3,725,158.)

3,743,280, D. Martinez, EXERCISING DEVICE, **filed** Aug. 5, 1974, D.C.N.J. (Trenton), Doc. C–74–1189, *Rainbow Lifegard Products Inc.* v. *General Home Products Corporation.* Case reported settled. Order of dismissal without costs, Feb. 19, 1975.

3,795,347, E. Singer, POWER PURGED LIQUID SAMPLER, **filed** Feb. 14, 1975, D.C., N.D. Calif. (San Francisco), Doc. C–75–0331 RHS, *Sirco Products Limited* v. *Manning Environmental Corp. and J. Gordon Schontzler.*

3,796,430, K. Sudo, COLLAPSIBLE BABY WALKER WITH PROTECTIVE COVERS FOR LEG JOINTS THEREOF, **filed** Feb. 13, 1975, D.C., E.D. Pa. (Philadelphia), Doc. C–75–426, *Century Products, Inc.* v. *Graco Metal Products, Inc., doing business as Swyngomatic Industries.*

3,809,261. (See 3,633,774.)

3,812,636, Albrecht, Curran and Lindner, SHEET METAL DECKING UNIT AND COMPOSITE FLOOR CONSTRUCTION UTILIZING THE SAME, **filed** Feb. 18, 1975, D.C., M.D. Fla. (Tampa), Doc. 75–125, *H. H. Robertson Company* v. *Epic Metals Corporation.*

3,834,220, H. O. Westmoreland, BUBBLE TEST FOR INTERNAL COMBUSTION ENGINES, **filed** Feb. 11, 1975, D.C., E.D. Mich. (Detroit), Doc. 75–70259, *Hollis O. Westmorcland* v. *General Motors Corp.*

3,842,732, J. Anderson, TAILGATE CONTROL FOR STACKERS, **filed** Feb. 20, 1975, D.C. Kans. (Wichita), Doc. 75–36–C6, *Hesston Corporation* v. *John Deere Company.* Plaintiff hereby voluntarily dismisses the above action in accordance with the provisions of Rule 41 of the Federal Rules of Civil Procedure. Service has not been made on the defendant in this matter, Feb. 20, 1975.

3,850,336, E. Acosta, COUNTERBALANCE APPARATUS FOR A REFUSE CONTAINER LID, **filed** Feb. 11, 1975, D.C., S.D. Fla. (Miami), Doc. 75–199–C–CA, *Enro Steel Containers Inc.* v. *Hydraulic Equipment Systems and Fabricating Inc.*

Re. 26,601. (See 3,232,761.)

D. 227,352, Meng and Driessen, PACKAGE WITH STAGGERED PRODUCT SLICES, **filed** Jan. 7, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c47, *L. D. Schreiber Cheese Co., Inc.* v. *Kraftco Corporation.*

D. 227,503, G. E. Raymond, MOBILE PHOTOCOPY CAMERA UNIT, **filed** Sept. 17, 1974, D.C.N.J. (Newark), Doc. C74–1442, *Gary E. Raymond* v. *M. P. Goodkin Co.* Stipulation and order of dismissal of action, Feb. 21, 1975.

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents on or before August 8, 1975.

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June 17, 1975.

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Certificates of Correction for the Week of July 8, 1975

3,676,099	3,847,029	3,868,913	3,874,845
3,679,006	3,847,920	3,869,340	3,874,917
3,765,015	3,847,947	3,869,436	3,874,969
3,766,223	3,849,522	3,869,468	3,874,994
3,773,016	3,849,601	3,869,482	3,875,098
3,773,473	3,850,954	3,869,500	3,875,110
3,774,393	3,851,010	3,869,544	3,875,111
3,778,440	3,852,202	3,869,573	3,875,248
3,778,527	3,852,366	3,870,095	3,875,334
3,784,542	3,853,017	3,870,289	3,875,350
3,784,705	3,853,670	3,870,291	3,875,412
3,786,342	3,854,021	3,870,585	3,875,496
3,793,186	3,854,956	3,870,604	3,875,559
3,795,783	3,855,535	3,870,660	3,875,579
3,796,951	3,855,980	3,870,823	3,875,930
3,801,183	3,855,983	3,870,824	3,876,365
3,802,454	3,856,515	3,870,856	3,876,712
3,809,885	3,856,539	3,870,887	3,876,793
3,810,865	3,856,607	3,870,943	3,876,945
3,811,381	3,857,185	3,871,231	3,876,958
3,811,914	3,857,526	3,871,302	3,877,769
3,816,302	3,857,894	3,871,402	3,878,168
3,817,157	3,857,936	3,871,447	3,878,170
3,821,293	3,858,216	3,871,486	3,878,242
3,825,080	3,858,623	3,871,639	3,878,279
3,825,543	3,858,887	3,871,659	3,878,467
3,825,633	3,859,257	3,871,778	3,878,622
3,826,191	3,859,317	3,871,980	3,878,655
3,826,769	3,859,330	3,871,985	3,878,871
3,831,112	3,860,565	3,872,062	3,878,937
3,831,293	3,860,589	3,872,258	3,878,942
3,831,574	3,860,696	3,872,261	3,879,125
3,831,727	3,860,759	3,872,289	3,879,206
3,832,025	3,861,963	3,872,434	3,879,237
3,832,076	3,862,249	3,872,469	3,879,238
3,833,894	3,862,610	3,872,937	3,879,258
3,835,226	3,862,789	3,872,994	3,879,354
3,836,674	3,862,934	3,873,204	3,879,360
3,839,293	3,864,020	3,873,316	3,879,414
3,840,503	3,864,265	3,873,387	3,879,512
3,842,116	3,864,382	3,873,463	3,879,563
3,842,332	3,864,726	3,873,625	3,880,570
3,842,379	3,864,790	3,873,656	3,881,213
3,843,899	3,864,854	3,873,742	3,882,062
3,845,386	3,865,656	3,873,780	3,882,094
3,846,090	3,865,751	3,873,792	3,882,375
3,846,107	3,867,554	3,873,793	3,882,429
3,846,431	3,867,998	3,874,020	3,882,443
3,846,468	3,868,221	3,874,155	
3,846,630	3,868,465	3,874,275	
3,846,658	3,868,588	3,874,445	

Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,304,563, M. J. Fino, ADHESIVE APPLYING MECHANISMS, Interference No. 97,244, decided Feb. 16, 1972, claims 1, 2, 6, 7, 9, 10, 14 and 15.

Patent No. 3,487,392, M. A. Lewis, INCREMENTAL WEB MEMBER DRIVE SYSTEM, Interference No. 97,932, decided Feb. 10, 1975, claims 2 and 3.

Patent No. 3,513,718, J. J. Tomecek, CONTROL SYSTEM ADJUSTMENT MEANS, Interference No. 97,610, decided Feb. 26, 1974, claim 1.

Patent No. 3,535,349, T. B. Windholz, A. A. Patchett, J. Fried, 13-POLYCARBON ALKYL-GONA-4-EN-3-ONES AND 17-ACYLATES THEREOF, Interference No. 97,824, decided Oct. 25, 1974, claim 1.

Patent No. 3,553,041, G. W. Von Hofe, METHOD OF AND MEANS FOR DETECTING CONDITIONS IN THE LABEL AREAS OF LABELED ARTICLES, Interference No. 98,198, decided Nov. 15, 1974, claims 1, 2, 3, 5 and 9.

Patent No. 3,575,502, R. Eppe, ELECTROPHOTOGRAPHIC COPYING ARRANGEMENT, Interference No. 98,084, decided Oct. 30, 1974, claims 1, 8 and 9.

Patent No. 3,634,203, W. R. McMahon, T. H. Ramsey, Jr., THIN FILM METALLIZATION PROCESSES FOR MICROCIRCUITS, Interference No. 98,018, decided Dec. 11, 1973, claims 1, 2, 3 and 4.

Patent No. 3,713,209, J. M. Biddison, AUTOMATIC ARMATURE WINDING, Interference No. 98,353, decided Mar. 3, 1975, claims 1, 4, 6, 7, 8, 9, 11, 13, 16 and 17.

Patent No. 3,750,873, R. R. Roman, COOKING AND STERILIZING BAG AND A BAG ROLL, Interference No. 98,785, decided Feb. 28, 1975, claims 1–4.

Patent No. 3,781,930, M. P. Spitz, CONNECTING DEVICE FOR ADJUSTABLE BEDFRAME, Interference No. 98,751, decided Feb. 5, 1975, claims 1, 4 and 5.

Disclaimers and Dedications

3,558,998.—*Robert B. Bertolasi*, Rockford, Ill. REVERSIBLE POLARITY UNIVERSAL ELECTRICAL DISCHARGE MACHINING POWER SUPPLY WITH CURRENT CUTOFF. Patent dated Jan. 26, 1971. Disclaimer and dedication filed Sept. 19, 1974, by the assignee, *Amated Industries Incorporated*.

Hereby disclaims and dedicates to the Public the remaining term of said patent.

3,637,244.—*Richard A. Strizki*, Ringoes, N.J. LOAD CONCENTRATED BREAKAWAY COUPLING. Patent dated Jan. 25, 1972. Disclaimer and dedication filed Oct. 18, 1974, by the assignee, *The State of New Jersey*.

Hereby disclaims and dedicates to the Public the remaining term of said patent.

Dedication

3,609,707.—*Jordan D. Lewis*, Worthington, and *Albert H. Adelman*, Columbus, Ohio. METHOD AND APPARATUS FOR GENERATING THREE-DIMENSIONAL PATTERNS. Patent dated Sept. 28, 1971. Dedication filed Aug. 2, 1974, by the assignee, *Battelle Development Corporation*.

Hereby dedicates to the People of the United States the entire remaining term of said patent.

Disclaimers

Design No. 234,022.—*Seymour R. Cray, Lester T. Davis*, and *Maurice D. Roush*, Chippewa Falls, Wis. COMPUTER MAINFRAME CONSOLE. Patent dated Dec. 31, 1974. Disclaimer filed Nov. 25, 1974, by the assignee, *Control Data Corporation*.

Hereby disclaims the term of the patent subsequent to Nov. 26, 1988.

3,536,722.—*Keisuke Murayama, Syoji Morimura*, and *Tetsuya Tanaka*, Tokyo, Japan. PIPERIDINE-N-OXYL-SPIROHYDANTOIN DERIVATIVES. Patent dated Oct. 27, 1970. Disclaimer filed Oct. 11, 1974, by the assignee, *Sankyo Company, Limited*.

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,579,088.—*Taylor C. Fletcher*, Fullerton, *Lawrence M. Silva*, Portuguese Bend, and *Bruce L. Wilkinson*, Torrance, Calif. FERRORESONANT TRANSFORMER WITH CONTROLLABLE FLUX. Patent dated May 18, 1971. Disclaimer filed Jan. 23, 1974, by the inventors.

Hereby enters this disclaimer to claims 1, 3, 7, 8, 9, 11, 12, 13 and 17 of said patent.

3,655,188.—*Karsten Solheim*, Phoenix, Ariz. CORRELATED GOLF CLUB SET. Patent dated Apr. 11, 1972, Disclaimer filed May 7, 1973, by the inventor.

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,732,682.—*Francis N. Crotty, William C. Gause*, and *George E. Hartranft*, Baltimore, Md. METHODS OF AND APPARATUS FOR TWISTING AND STRANDING CABLE PAIRS IN A TANDEM OPERATION. Patent dated May 15, 1973. Disclaimer filed Sept. 23, 1974, by the assignee, *Western Electric Company, Incorporated.*

Hereby enters this disclaimer to claims 1–24, 27–28, 38–40 and 42 of said patent.

3,732,940.—*Warren H. Price*, Sheboygan, Wis. TRACTOR SUBASSEMBLY. Patent dated May 15, 1973. Disclaimer filed Aug. 29, 1973, by the assignee, *Gilson Bros. Co.*

Hereby enters this disclaimer to claims 1, 2 and 3 of said patent.

3,742,559.—*Stephen Punako, Bainbridge*, and *George J. Swanson*, Sidney, N.Y. PLASTIC CABLE SUPPORT. Patent dated July 3, 1973. Disclaimer filed July 30, 1973, by the assingee, *The Bendix Corporation.*

Hereby disclaims the term of the patent subsequent to Mar. 13, 1990.

3,772,104.—*Edwin Arthur Chandross*, Murray Hill, and *Theodore Arthur Shankoff*, Mendham, N.J. FABRICATION OF THIN FILM DEVICES. Patent dated Nov. 13, 1973. Disclaimer filed Dec. 17, 1973, by the assingee, *Bell Telephone Laboratories, Incorporated.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,772,245.—*Martin Dexter*, Briarcliff Manor, N.Y. POLYOLEFINS STABILIZED WITH ORGANIC HYDRAZINE COMPOUNDS AND PHENOLIC ANTIOXIDANTS. Patent dated Nov. 13, 1973. Disclaimer filed Jan. 21, 1974, by the assignee, *Ciba-Geigy Corporation.*

Hereby enters this disclaimer to claim 1 of said patent.

3,783,394.—*Leslie Ronald Avery*, Byfleet, England. FREQUENCY COMPARATOR SYSTEM. Patent dated Jan. 1, 1974. Disclaimer filed July 17, 1974, by the assignee, *RCA Corporation.*

Hereby enters this disclaimer to claims 1 through 5 of said patent.

3,785,094.—*Rudolf Holzhauer*, Marienheide/Rhineland, Germany. ABRASIVE MEDIUM. Patent dated Jan. 15, 1974. Disclaimer filed Feb. 6, 1974, by the assignee, *Firma August Ruggeberg.*

Hereby disclaims the term of the patent subsequent to Oct. 2, 1990.

3,794,378.—*Harry Haslam, Detroit*, and *Giulio Massetti* and *Herbert W. Truesdale*, Dearborn Heights, Mich. SEAT ASSEMBLY. Patent dated Feb. 26, 1974. Disclaimer filed June 17, 1974, by the assignee, *Ford Motor Company.*

Hereby enters this disclaimer to claims 1 to 5, inclusive, of said patent.

3,848,983.—*Elmer G. Fridrich*, Chardon, Ohio. OPTICAL SYSTEM FOR PROVIDING UNIFORM EXPOSURE OF A PHOTOSENSITIVE SURFACE. Patent dated Nov. 19, 1974. Disclaimer filed Nov. 29, 1974, by the assignee, *General Electric Company.*

Hereby disclaims the term of the patent subsequent to Jan. 29, 1990.

National Technical Information Service

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DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
National Institutes of Health, Chief, Patent Branch,
Bethesda, Md. 20014

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DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research,
Arlington, Va. 22217

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Patent application 415,024. Method and Apparatus for Injection Molding of Explosive and Pyrotechnic Material. Filed Nov. 12, 1973. PC $3.25/MF $2.25.

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Patent application 540,367. Slit Coupled Strip Transmission Line. Filed Jan. 13, 1975. PC $3.25/MF $2.25.

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters, NASA—Code GP2, Washington, D.C. 20546

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Assistant General Counsel for Patents, Washington, D.C. 20545

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DEPARTMENT OF AGRICULTURE
Chief, Research Agreements and Patent Mgmt. Branch, Federal Bldg., Hyattsville, Md. 20782

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DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
National Institutes of Health, Chief, Patent Branch, Bethesda, Md. 20014

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DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Arlington, Va. 22217

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ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION
Assistant General Counsel for Patents
Washington, D.C. 20545

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DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

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Patent 3,861,137. Monopropellant Electrolytic Igniter. Filed June 19, 1973. Patented Jan. 21, 1975. Not available NTIS.

Patent 3,861,209. Low Pressure Test for Reservoir Level System. Filed Dec. 11, 1973. Patented Jan. 21, 1975. Not available NTIS.

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Patent 3,861,723. V-Band Coupling. Filed Aug. 28, 1973. Patented Jan. 21, 1975. Not available NTIS.

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Patent 3,861,987. Gauge Installation Tool. Filed Oct. 11, 1973. Patented Jan. 21, 1975. Not available NTIS.

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Patent 3,863,257. Passive Ranging by Time Difference Multi-Path. Filed June 27, 1972. Patented Jan. 28, 1975. Not available NTIS.

DEPARTMENT OF AGRICULTURE
Chief, Research Agreements and Patent Mgmt. Branch,
Federal Bldg., Hyattsville, Md. 20782

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DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
National Institutes of Health, Chief, Patent Branch,
Bethesda, Md. 20014

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters, NASA—
Code GP 2, Washington, D.C. 20546

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Patent application 545,285. Scattering Independent Determination of Absorption and Emission Coefficients and Radiative Equilibrium State. Filed Jan. 29, 1975. PC $3.25/MF $2.25.

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DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
National Institutes of Health, Chief, Patent Branch,
Bethesda, Md. 20014

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DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research,
Arlington, Va. 22217

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ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION
Assistant General Counsel for Patents
Washington, D.C. 20545

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DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

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Patent 3,866,224. Frequency Diversity Radar System. Filed Oct. 13, 1958. Patented Feb. 11, 1975. Not available NTIS.

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DEPARTMENT OF AGRICULTURE
Chief, Research Agreements & Patent Mgmt. Branch, General Services Div., Hyattsville, Md. 20782

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DEPARTMENT OF TRANSPORTATION
Patent Counsel, 400 7th St. SW., Washington, D.C. 20590

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DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
National Institutes of Health, Westwood Bldg., Bethesda, Md. 20014

Patent application 546,786. Polysiloxane Membrane Lung. Filed Feb. 3, 1975. PC $3.25/MF $2.25.

DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research, Arlington, Va. 22217

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters, NASA—Code GP–2, Washington, D.C. 20546

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ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION
Assistant General Counsel for Patents
Washington, D.C. 20545

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Patent 3,851,248. Vibrating Fiber Electrometer. Filed Aug. 17, 1973. Patented Nov. 26, 1974. Not available NTIS.

Patent 3,851,274. Recirculating Liquid-Nitrogen-Coolant System for Solid-State Lasers. Filed June 29, 1973. Patented Nov. 26, 1974. Not available NTIS.

DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

Patent application 452,590. Bubble Domain Structures. Filed Mar. 9, 1974. PC $3.25/MF $2.25.

Patent application 488,129. System for Adjusting Individual Sensors in an Array. Filed July 12, 1974. PC $3.25/MF $2.25.

Patent application 492,076. Braking Device for Aircraft Gyroscope. Filed July 26, 1974. PC $3.25/MF $2.25.

Patent application 494,936. Means and Method for Determining Meridan Location and Azimuth. Filed Aug. 5, 1974. PC $3.25/MF $2.25.

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Patent application 525,592. Laser Power Supply. Filed Nov. 20, 1974. PC $3.25/MF $2.25.

Patent application 525,594. Self-Referencing Retransmitting Alignment Sensor for a Collimated Light Beam. Filed Nov. 20, 1974. PC $3.25/MF $2.25.

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Patent application 529,194. Heat Pipe System. Filed Dec. 3, 1974. PC $3.25/MF $2.25.

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Patent application 531,645. Calorimeter for an Unstable Laser Resonator. Filed Dec. 11, 1974. PC $3.25/MF $2.25.

Patent application 535,060. Rotatable Window Means. Filed Dec. 20, 1974. PC $3.25/MF $2.25.

Patent application 535,061. Dynamic Damping Apparatus. Filed Dec. 20, 1974. PC $3.25/MF $2.25.

Patent application 535,066. A Precision Light Exposure Timing Mechanism for a Wide Range of Exposure Duration. Filed Dec. 20, 1974. PC $3.25/MF $2.25.

Patent application 535,067. Method of Connecting a Metal Conduit to a Plastic Conduit. Filed Dec. 20, 1974. PC $3.25/MF $2.25.

Patent 3,845,409. Laser Grating Couplers. Filed Nov. 27, 1973. Patented Oct. 29, 1974. Not available NTIS.

Patent 3,846,376. Thermally Stable Perfluoroalkylene Ether Bibenzoxazole Polymers. Filed Sept. 26, 1973. Patented Nov. 5, 1974. Not available NTIS.

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Patent 3,854,325. Method and Means for Determining Fatigue Damage and Surface Stress. Filed July 13, 1973. Patented Dec. 17, 1974. Not available NTIS.

Patent 3,855,686. Cartridge Link Guide Assembly. Filed Nov. 27, 1973. Patented Dec. 27, 1974. Not available NTIS.

Patent 3,855,849. Reentry Vehicle Nose Tip Flight Testing Apparatus. Filed Apr. 16, 1973. Patented Dec. 24, 1974. Not available NTIS.

Patent 3,858,209. Radar Moving Target Tracking System. Filed July 27, 1962. Patented Dec. 31, 1974. Not available NTIS.

Patent 3,858,213. Antenna With Short Line Tuning Stub. Filed Oct. 18, 1965. Patented Dec. 31, 1974. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters, NASA—Code GP–2, Washington, D.C. 20546

Patent application 533,734. The DC-to-DC Converters Employing Staggered Phase Power Switches With Two Loop Control. Filed Dec. 17, 1974. PC $3.25/MF $2.25.

Patent 3,859,736. Kinesthetic Control Simulator. Patented Jan. 14, 1975. Not available NTIS.

Patent 3,860,858. Variable Frequency Inverter for AC Induction Motors With Torque, Speed and Braking Control. Patented Jan. 14, 1975. Not available NTIS.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JUNE 7, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-8-74
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur: Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-26-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-24-74
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products: Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions: Bleaching; Dyeing and Photography.	9-17-74
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-22-74
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures: Illumination: Horology; Acoustics; Recorders; Weighing Scales.	12-4-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	3-11-74
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	8-22-74
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	11-15-74
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	5-8-74
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	3-4-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	9-25-74
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools: Cutlery; Jacks.	9-23-74
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-30-74
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	10-8-74
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	11-18-74

Expiration of patents: The patents within the range of numbers indicated below expire during July 1975, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,840,821 to 2,845,624 inclusive
Plant Patents..... Numbers 1,722 to 1,739 inclusive

REISSUES

JULY 8, 1975

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 28,463
LIST FINDER WITH INSERTABLE INFORMATION CARDS

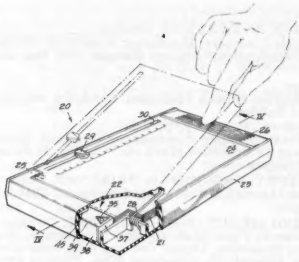
Chuzo Mori, Tokyo, Japan, assignor to Carl Manufacturing Company Ltd., Tokyo, Japan

Original No. 3,820,264, dated June 28, 1974, Ser. No. 316,815, Dec. 20, 1972. Application for reissue Sept. 9, 1974, Ser. No. 504,042

Claims priority, application Japan, Sept. 28, 1972, 47-112875

Int. Cl. B42f *21/00*

U.S. Cl. 40—104.01 **17 Claims**



1. A list finder comprising

a horizontally disposed holder having a forward end and defining a receptable therein,

a card cartridge, disposed in said receptacle, comprising a plurality of stacked elongated and rectangular information cards having indicia formed thereon and releasably clamped together entirely across their forward ends by clamping means, said clamping means comprising a clamping device having top and bottom members connected together to respectively overlie and underlie the forward ends of said information cards,

a normally closed cover pivotally mounted on said holder to cover said cards and means for selectively raising said cover, said cover having pointer means movably mounted thereon to selectively expose one of said information cards upon opening of said cover, and

retaining means, releasably mounting a forward end of said card cartridge in the forward end of said holder for permitting composite removal of said card cartridge therefrom.

Re. 28,464
MAGNETIC SUSPENSION FLOWMETERS

Jean-Loup Bonnet, par Verrieres le Buisson, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Original No. 3,630,078, dated Dec. 28, 1971, Ser. No. 872,971, Oct. 31, 1969. Application for reissue Apr. 17, 1974, Ser. No. 425,907

Int. Cl. E21b *47/00*

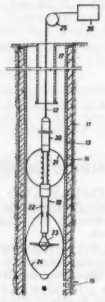
U.S. Cl. 73—155 **21 Claims**

1. Apparatus for measuring fluid flow rate in a well borehole comprising:

a body member sized for passage through a well bore;

a longitudinal shaft member rotatably mounted in said body member so that it is also free to undergo limited motion along the direction of the longitudinal axis of said body member, said shaft member having at least a portion of its length comprised of ferromagnetic material and having an end portion extending exteriorly to said body member;

a measuring screw system including a plurality of foldable blades carried on the exterior portion of said shaft member together with means for folding and unfolding said blades; and



solenoid means mounted in said body member and adjacent said shaft member so that an electrical current flowing in said solenoid interacts with said ferromagnetic portion of said shaft to suspend it free of touching engagement with any supporting member.

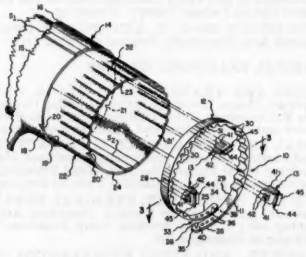
Re. 28,465
SEWING AID DEVICE FOR, AND METHOD OF, SETTING A SLEEVE IN THE ARMHOLE OF A BODICE

Regina Reidy, 258 W. 7th St., Emporium, Pa. 15834

Original No. 3,776,436, dated Dec. 4, 1973, Ser. No. 343,395, Mar. 21, 1973. Continuation-in-part of Ser. No. 221,994, Jan. 31, 1972 abandoned. Application for reissue Sept. 3, 1974, Ser. No. 502,611

Int. Cl. A41h *43/00*

U.S. Cl. 223—1 **18 Claims**



1. A sewing aid device for setting a sleeve in the armhole of a bodice, comprising an elongated strip having a first surface on one side arranged to be covered by the marginal portion of said bodice at said armhole, and also having for a portion of its longitudinal extent a second surface on its opposite side arranged to cover the cap portion of said sleeve, said second surface having a series of depressions extending transversely of said strip and spaced from one another longitudinally therealong, and means for holding such bodice marginal portion against said first surface and for holding such sleeve cap portion against said second surface whereby the material of said sleeve cap portion is gathered relative to said bodice marginal portion.

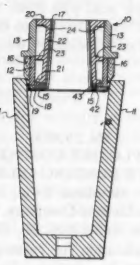
Re. 28,466
HOT TOP FOR BIG-END-UP INGOT MOLDS AND METHOD OF ASSEMBLING SAME

Fred Eastwood, Fairview Park; John Harry Brindle, Lakewood, both of Ohio, and Frederick L. Kolb, Jr., Venetia, Pa., assignors to Foseco International Ltd., Birmingham, England

Original No. 3,458,169, dated July 29, 1969, Ser. No. 389,656, Aug. 14, 1964. Application for reissue June 20, 1972, Ser. No. 273,526

Int. Cl. B22d *7/10*

U.S. Cl. 249—201 **10 Claims**



1. A low volume, rapid turn-around hot top especially adapted for use with a big-end-up ingot mold having a top opening of a predetermined cross-sectional area comprising, in combination, a metal casing adapted to be mounted on the top of a big-end-up mold, the inside surface of said metal casing being inclined downwardly and outwardly to provide a gradually increasing hot top opening, a refractory bottom ring secured to the lower end of said metal casing with the *entire* inside surface of said ring being substantially flush with the inside surface of said metal casing and tapered at the same angle, and an expandable, highly insulating refractory liner comprising a plurality of preformed refractory boards fitted within said metal casing in bearing engagement with the inclined surfaces thereof *and wedged tightly together against the inside surface of said casing with the longitudinal edges of said boards abutting each other*, the lower portions of said boards extending downwardly in bearing engagement with the inner surfaces of said bottom ring to substantially prevent the spread of molten metal upwardly therebetween.

Re. 28,467
THROWING MEMBER AND PAIR OF MULTIPLE-TARGET AREA POST MEMBERS

Frank E. Curtiss, 819 East Erie St., Painesville, Ohio 44077, and Jack E. Curtiss, 246 Corduroy Rd., Mentor, Ohio 44060

Original No. 3,602,509, dated Aug. 31, 1971, Ser. No. 857,084, Sept. 11, 1969. Application for reissue Aug. 31, 1973, Ser. No. 393,551

Int. Cl. A63b *71/00*

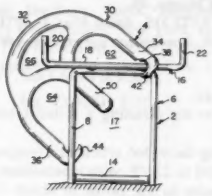
U.S. Cl. 273—100 **13 Claims**

1. A game system comprising,

a pair of post members each having a multiple-target-area-like construction adapted to be mounted in spaced apart relation on a support surface,

at least one throwing member having multiple-scoring-area-like construction adapted to be thrown into scoring registration with said post members,

said post members each include a generally inverted U-shaped lower section defining a closed target area, and a generally U-shaped upper section made integral with said lower section and facing outwardly away from said lower section.



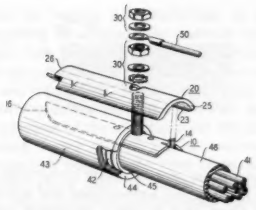
Re. 28,468
CABLE SHIELD CONNECTOR

Robert Garland Baumgartner, Baltimore, Md., and Harry James Graff, Somerville, N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Original No. 3,757,269, dated Sept. 4, 1973, Ser. No. 181,030, Sept. 16, 1971. Application for reissue May 2, 1974, Ser. No. 466,381

Int. Cl. H01r *3/06*

U.S. Cl. 339—14 L **9 Claims**



1. A connector assembly for providing electrical connection to the shield of a cable having a plurality of conductors within said shield and a protective jacket overlaying said shield, with said shield and said jacket having discontinuity therein to form ends, comprising, in combination:

a first plate of conductive material having top and bottom surfaces and first and second ends, said plate having an upstanding tang on said second end thereof;

a threaded stud mounted on said first plate and extending upwardly therefrom; said first plate adapted to have said first end inserted into said cable in contact with said shield so that said stud abuts said ends and said second end extends away from said ends along said cable [ ];

a second plate having top and bottom surfaces and having first and second ends corresponding to said first and second ends of said first plate and adapted for installation on said stud over the exterior of said jacket; and

mounting means engaging said stud for forcing said second plate toward said first plate to cause said second end of said second plate to contact said tang causing said second plate to pivot thereabout so that said first ends of said first and second plates clamp together whereby said jacket and said shield can be clamped between said first ends when said assembly is installed on said cable.

Re. 28,469

DRY CLEANING PROCESS

Ector P. Impullitti, deceased, late of Detroit, Mich. (by Madeline Impullitti, administratrix), assignor to F. W. Means & Company, Chicago, Ill.

Original No. 3,577,215, dated May 4, 1971, Ser. No. 796,069, Feb. 3, 1969. Application for reissue Apr. 27, 1973, Ser. No. 355,107

Int. Cl. D06l *1/02*

U.S. Cl. 8—142 12 Claims

1. A process for cleaning a soiled textile *cleaning* article comprising:

a. contacting the soiled article at a temperature in the range of about 60 to 250°F. with a petroleum mineral oil having [a viscosity in the range of about 100 to 800 SUS at 100°F. and] *lubricating viscosity and having viscosity-gravity constant in the range of about 0.79 to 1.05 substantially as sole cleaning agent* in an amount in excess of that necessary to saturate the article;

b. agitating the oil while in contact with said articles;

c. and removing the excess oil from the cleaned, oil-impregnated textile article.

Re. 28,470

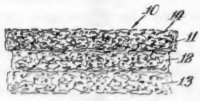
POROUS METAL STRUCTURE

Harold H. Webber, Groton, Mass., assignor to Brunswick Corporation, Skokie, Ill.

Original No. 3,469,297, dated Sept. 30, 1969, Ser. No. 543,980, Apr. 20, 1966. Application for reissue June 6, 1974, Ser. No. 477,101

Int. Cl. B32b *5/26, 15/18;* B32p *17/06*

U.S. Cl. 29—180 R 2 Claims



37. A porous metal web structure comprising a plurality of substantially fracture free unmachined and unburnished staple length metal fibers each having a maximum cross-section dimension of less than 50 microns, said fibers having rough outer surfaces and being interlocked in an intermingled relationship substantially solely by means of said rough outer surfaces thereof in frictional engagement, said fibers each provided with tension broken ends.

Re. 28,471

Co-Ni-Cr BASE AUSTENTIC ALLOYS PRECIPITATION STRENGTHENED BY INTERMETALLIC COMPOUNDS AND CARBIDES

Mahesh C. Chaturvedi, 919-17 University Crescent, Winnipeg, Manitoba, Canada

Original No. 3,790,372, dated Feb. 5, 1974, Ser. No. 250,230, May 4, 1972. Application for reissue June 25, 1974, Ser. No. 483,053

Int. Cl. C22c *19/00*

U.S. Cl. 75—134 F 3 Claims

1. An alloy having a face centered cubic structure consisting essentially of the combination by weight of between 35 percent and 45 percent Cobalt, between 35 percent and 45 percent Nickel, and between 16 percent and 20 percent Chromium, said alloy being precipitation strengthened by the addition of a compound to make up 100 percent by weight taken from the group comprising intermetallic compound and carbides, the intermetallic compound being selected from the group comprising Titanium, Niobium and Aluminium, the carbides being selected from the group comprising Titanium and Carbon, and [Nickel] *Niobium* and Carbon.

Re. 28,472

FLUX FOR USE IN SOLDERING OF STAINLESS STEELS

Lester Aronberg, Chicago, Ill., assignor to Lake Chemical Co., Chicago, Ill.

Original No. 3,597,285, dated Aug. 3, 1971, Ser. No. 821,482, May 2, 1969. Application for reissue Apr. 5, 1974, Ser. No. 458,195

Int. Cl. B23k *35/34*

U.S. Cl. 148—26 23 Claims

11. The method of making a flux for use in soldering stainless steels which comprises admixing approximately 100 parts of 75–105% phosphoric acid with from 1 to 20 parts of basic copper carbonate and with from 20 to 60 parts of an ammonium phosphate, said parts being by weight.

Re. 28,473

PRIMARY EXPLOSIVE COMPOSITIONS FOR EXPLOSIVE BONDING OR FORMING

Terri Giversen Steele, Hamilton Twp., Mercer County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Original No. 3,704,186, dated Nov. 28, 1972, Ser. No. 174,194, Aug. 23, 1971. Application for reissue Nov. 15, 1974, Ser. No. 524,281

Int. Cl.[2] C06C *1/02*

U.S. Cl. 149—35 14 Claims

1. Primary explosive composition useful in explosive bonding, forming or similar processes, said composition comprising:

a. 60–70% by weight of colloidal lead azide;

b. balance essentially vehicle selected from the group consisting of:

i. beta-terpineol in an amount equal to approximately 92% by weight of the vehicle, ethyl cellulose constituting the balance of the vehicle;

ii. Beta-terpineol in an amount equal to approximately 90% by weight of the vehicle, polyvinyl butyral constituting the balance of the vehicle; and

iii. pine oil in amount equal to approximately 92% by weight of the vehicle, ethyl cellulose constituting the balance of the vehicle.

Re. 28,474

PROCESS FOR RAPIDLY DISSOLVING WATER-SOLUBLE POLYMERS

Donald R. Anderson, Oswego, and Alvin J. Frisque, La Grange, both of Ill., assignors to Nalco Chemical Co., Oak Brook, Ill.

Original No. 3,624,019, dated Nov. 30, 1971, Ser. No. 92,031, Dec. 15, 1970. Application for reissue Nov. 8, 1973, Ser. No. 413,831

Int. Cl. C08f *47/16, 47/18*

U.S. Cl. 260—29.6 H 19 Claims

1. A method of rapidly dissolving an acrylamide polymer into water, which comprises the steps of:

A. preparing a water-in-oil emulsion which contains dispersed therein [a] *between 5–75 percent by weight of* finely divided acrylamide polymer; [thereby providing an acrylamide polymer containing emulsion; and then,] *said emulsion having an oil-to-water ratio between 5:1 – 1:10 and said oil being a hydrocarbon liquid; and then,*

B. inverting said emulsion in water which contains a water-soluble surfactant whereby the acrylamide polymer is released into the water as a solution.

Re. 28,475

PROCESS FOR COPOLYMERIZATION OF MALEIC ANHYDRIDE WITH 1-OLEFINS

Ronald G. Blecke, Lower Salford Twp., Montgomery County, and Robert W. Hill, Gibsonia, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Original No. 3,729,451, dated Apr. 24, 1973, Ser. No. 270,331, July 10, 1972. Application for reissue Mar. 13, 1974, Ser. No. 450,822

Int. Cl.[2] C08F *2/02, 2/08, 222/06*

U.S. Cl. 260—78.5 R **6 Claims**

1. A dispersion process for manufacturing a copolymer of maleic anhydride with an aliphatic 1-olefin comprising the steps:

a. forming a reaction mixture by mixing together at least one polymerizable liquid 1-olefin having from 4 to 14 carbon atoms, a minor amount of an equimolecular copolymer of maleic anhydride with a linear aliphatic 1-olefin having from 14 to 18 carbon atoms as a dispersing agent, a polymerization initiator and a quantity of maleic anhydride which is less than a molar equivalent of the amount of 1-olefin present,

b. agitating the reaction mixture of step (a) and heating to increase the temperature to the point at which the polymerization reaction is initiated,

c. continuing agitation of the reaction mixture at a temperature near the decomposition temperature of the polymerization initiator until a dispersion of solid copolymer particles in liquid 1-olefin is obtained as a polymerization product mixture, and

d. recovering the solid particles of product from the polymerization product mixture by filtration or evaporation of the liquid 1-olefin.

Re. 28,476

CONTROL OF ENVIRONMENTAL POLLUTION IN TALL OIL FRACTIONATION

Dellason F. Bress, Murray Hill, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Original No. 3,709,793, dated Jan. 9, 1973, Ser. No. 840,723, July 10, 1969. Application for reissue Aug. 8, 1973, Ser. No. 391,892

Int. Cl. C09f *1/00*

U.S. Cl. 260—97.6 **14 Claims**

1. A plant for treating the stripping steam and odorous material carried therein after stripping a tall oil fractionating tower in a manner to reduce pollution comprising:

a conduit circuit, said circuit comprising:

a condenser for condensing said steam, said condenser having an inlet and outlet, the outlet and inlet of said condenser being connected with each other by said circuit so that condensate from said condenser is recirculated from the outlet thereof through the inlet thereof;

a purging outlet to purge from said circuit a portion of the circulating water and entrained odorous material at a rate of flow approximately equal to the rate at which said stripping steam enters said condenser;

a vaporizer connected with said purging outlet for vaporizing the condensate and entrained odorous matter coming through said outlet, to separate it from the entrained organic material;

a conduit connected between said vaporizer and said fractionating tower for directing the vapor from said vaporizer to said fractionating tower; and

means between said purging outlet and said vaporizer to separate from said odorous material and water, non-condensible gases, so that said non-condensible gases can be incinerated.

Re. 28,477

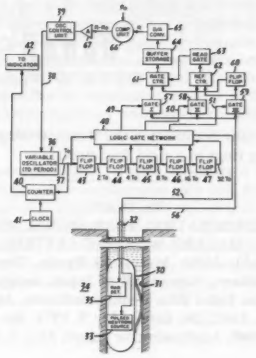
METHOD AND APPARATUS FOR MEASURING NEUTRON CHARACTERISTICS OF A MATERIAL SURROUNDING A WELL BORE

William B. Nelligan, Danbury, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Original No. 3,566,116, dated Feb. 23, 1971, Ser. No. 592,795, Nov. 8, 1966. Application for reissue Feb. 23, 1973, Ser. No. 335,165

Int. Cl. G01t *1/16*

U.S. Cl. 250—262 **67 Claims**



1. A method for logging a characteristic of an unknown material comprising irradiating the material with neutrons during at least two spaced irradiation intervals, detecting indications of the neutron concentration in the material during first and second periods, respectively, after commencement of the corresponding irradiation interval, determining a neutron characteristic of the material from the detected indications occurring during at least one measurement interval during the respective periods, the time of occurrence of at least one measurement interval during the second period being variable, and controlling automatically the variable time of at least one measurement interval during the second period in accordance with the neutron characteristic determined from the indications detected during the first period in the same logging run.

Re. 28,478

WINDING SUPPORT SYSTEM FOR A DYNAMOELECTRIC MACHINE

John J. Bahn; Almy D. Coggeshall, both of Schenectady; Richard T. Maher, Wilton, and John B. Waldbillig, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

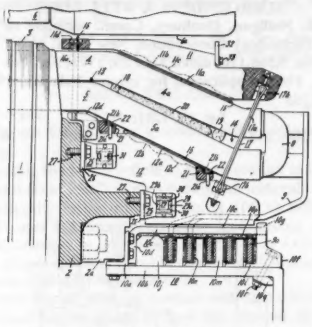
Original No. 3,089,048, dated May 7, 1963, Ser. No. 33,808, June 3, 1960. Application for reissue June 15, 1973, Ser. No. 370,349

Int. Cl. H02k *3/46*

U.S. Cl. 310—260 **9 Claims**

9. For use on a dynamoelectric machine stator having a circumferential structural member supporting the end turns of the stator winding, the combination of a plurality of axially spaced collecting rings electrically connected to said end turns, first stationary means restraining said collecting rings in an axial direction, a plurality of rigid spacer means interposed between said collecting rings, second means movable in an axial direction relative to one another and with respect to said first means and transversely to the collecting rings, a plurality of conformable thermosetting pads disposed between the

collecting rings and said spacer means, and third adjustable means causing the second means to move toward the first



stationary means constricting the thermosetting pads to hold the collecting rings in a rigid framework.

Re. 28,479

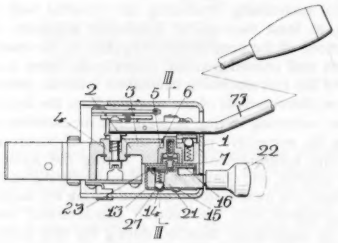
COMBINATION TURN-SIGNAL AND HAZARD-WARNING SYSTEM

Masaru Suzuki, Aichi; Masayoshi Hyodo, Toyota, and Yoshiaki Kurihara, Nagoya, all of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Japan

Original No. 3,662,336, dated May 9, 1972, Ser. No. 834,269, June 18, 1969. Application for reissue May 7, 1974, Ser. No. 467,779

Int. Cl. B60q *1/38*

U.S. Cl. 340—81 F **11 Claims**



1. A combined turn-signal and hazard-warning signal system for a vehicle having right and left indicator lights, comprising:

stationary housing means;

actuating means movably mounted on said housing means, said actuating means including a movable actuating member normally maintained in a neutral position and being movable into first and second actuating positions disposed on substantially opposite sides of said neutral position;

holder means mounted on said housing means for movement in a first direction between a turn-signal position and a hazard-warning position;

first movable contact means mounted on said holder means for movement therewith in said first direction;

second movable contact means movably mounted on said housing means for movement in a plane substantially transverse to said first direction, said second movable contact means being disposed for actuation and movement into first and second operative positions by said actuating member when same is moved into said first and second actuating positions, respectively;

stationary contact means mounted on said housing means and disposed for coaction with said first and second movable contact means for controlling energization of the right and left indicator lights;

first circuitry means for permitting flashing of a selected one of said right and left indicator lights, said first circuitry means causing flashing of only said left indicator lights when said second movable contact means is in said second operative position and said holder means is in said turn-signal position, said first circuitry means including cooperating contacts on said second movable contact means and said stationary contact means and further cooperating contacts on said stationary contact means and said first movable contact means;

second circuitry means connected to both said right and left indicator lights for permitting flashing of both said right and left indicator lights when said holder means is in said hazard-warning position, said second circuitry means including cooperating contacts coacting between said first movable contact means and said stationary contact means for causing energization and flashing of both said right and left indicator lights;

said stationary contact means including an insulator plate fixedly secured to said housing means and positioned between said first and second movable contact means, said stationary contact means including a first plurality of sationary contacts disposed adjacent one side of said insulator plate and a second plurality of stationary contacts disposed adjacent the other side of said insulator plate, at least some of said first plurality of stationary contacts being conductively interconnected to at least some of the contacts of said second plurality of stationary contacts, and said first and second plurality of stationary contacts being disposed for engagement with said first and second movable contact means, respectively;

said second plurality of stationary contacts including first, second and third stationary contacts disposed for coaction with said second movable contact means, said second movable contact means including a conductive element having a first portion thereof disposed in continuous engagement with said first stationary contact and having second and third movable portions positioned for alternate engagement with said second and third stationary contacts, respectively, said second and third stationary contacts being connected to the right and left indicator lights respectively;

said first plurality of stationary contacts including fourth, fifth and sixth stationary contacts conductively connected to said first, second and third stationary contacts, respectively; and

said first movable contact means including a first movable contact disposed for engagement with said fourth stationary contact only when said holder means is in said turn-signal position, and said first movable contact means including second and third movable contacts disposed for engagement with the fifth and sixth stationary contacts only when said holder means is in said hazard-warning position.

11. A combined turn-signal and hazard-warning signal system for a vehicle having right and left indicator lights, comprising:

stationary housing means;

actuating means movably mounted on said housing means, said actuating means including a movable actuating member normally maintained in a neutral position and being movable into first and second actuating positions disposed on substantially opposite sides of said neutral position;

holder means mounted on said housing means for movement in a first direction between a turn-signal position and a hazard-warning position;

first movable contact means mounted on said holder means for movement therewith in said first direction;

second movable contact means movably mounted on said housing means for movement substantially transverse to a plane including the under-mentioned insulator plate of the stationary contact means, said second movable contact means being disposed for actuation and movement into first

and second operative positions by said actuating member when same is moved into said first and second actuating positions, respectively;

stationary contact means mounted on said housing means and disposed for coaction with said first and second movable contact means for controlling energization of the right and left indicator lights;

first circuitry means for permitting flashing of a selected one of said right and left indicator lights, said first circuitry means causing flashing of only said left indicator lights when said second movable contact means is in said second operative position and said holder means is in said turn-signal position, said first circuitry means including cooperating contacts on said second movable contact means and said stationary contact means and further cooperating contacts on said stationary contact means and said first movable contact means;

second circuitry means connected to both said right and left indicator lights for permitting flashing of both said right and left indicator lights when said holder means is in said hazard-warning position, said second circuitry means including cooperating contacts coacting between said first movable contact means and said stationary contact means for causing energization and flashing of both said right and left indicator lights;

said stationary contact means including an insulator plate fixedly secured to said housing means and positioned between said first and second movable contact means, said stationary contact means including a first plurality of stationary contacts disposed adjacent one side of said insulator plate and a second plurality of stationary contacts disposed adjacent the other side of said insulator plate, at least some of said first plurality of stationary contacts being electrically interconnected to at least some of the contacts of said second plurality of stationary contacts, and said first and second plurality of stationary contacts being disposed for engagement with said first and second movable contact means, respectively;

said second plurality of stationary contacts including first, second and third stationary contacts disposed for coaction with said second movable contact means, said second movable contact means including a conductive element having a first portion thereof disposed in continuous engagement with said first stationary contact and having second and third movable portions positioned for alternate engagement with said second and third stationary contacts, respectively, said second and third stationary contacts being connected to the right and left indicator lights respectively;

said first plurality of stationary contacts including fourth, fifth and sixth stationary contacts electrically connected to said first, second and third stationary contacts, respectively; and

said first movable contact means including a first movable contact disposed for engagement with said fourth satationary contact only when said holder means is in said turn-signal position, and said first movable contact means including second and third movable contacts disposed for engagement with the fifth and sixth stationary contacts only when said holder means is in said hazard-warning position.

PLANT PATENTS

GRANTED JULY 8, 1975

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,739

CARNATION PLANT

Alexandre Barberet and Henri Blanc, La Londe, France, assignors to Laboratoire de Physiologie Vegetale de La Londe Barberet & Blanc, La Londe, France

Filed Feb. 19, 1974, Ser. No. 443,605

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—73 **1 Claim**

1. A new and distinct variety of carnation plant substantially as herein shown and described, characterized by its precocity and abundant year around production of bright, medium sized blossoms, and the stability of the flower color which holds throughout the winter season.

3,740

CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Mar. 7, 1974, Ser. No. 449,069

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of chrysanthemum capable of being grown in cut spray programs or as a pot mum and characterized particularly as to its uniqueness by its seven week response period; superior permanence of 14–20 days due to improved form and color retention; its 40"–45" height in cut spray programs given 2–3 weeks of long days, and by its lavender flower color, with the flower having a purple dot in the center of the disc which disappears as the flower matures.

3,741

CHRYSANTHEMUM PLANT

Charles B. Coward, Fort Myers, Fla., and Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Charles B. Coward, Fort Myers, Fla.

Filed Mar. 20, 1974, Ser. No. 453,034

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—81 **1 Claim**

1. A new and distinct cultivar of chrysanthemum characterized particularly as to its uniqueness when compared to the parent cultivar Belair by its more intense lavender coloration.

PATENTS

GRANTED JULY 8, 1975

ERRATA

For CLASS	See PATENT NO.
180-069	3,893,207
228-107	3,893,222
228-110	3,893,223
228-124	3,893,224
228-173	3,893,225
228-170	3,893,226
228-44.1	3,893,612
029-200 J	3,893,613
254-093 R	3,893,650
301-012 R	3,893,688
301-039 R	3,893,689
301-108 A	3,893,690
302-002 R	3,893,691
303-007	3,893,692
303-021 F	3,893,693
303-021 F	3,893,694
303-021 P	3,893,695
303-021 F	3,893,696
303-006.1	3,893,697
303-089	3,893,698
106-272	3,893,839
106-288	3,893,840
106-306	3,893,841
127-029	3,893,842
134-010	3,893,843
273-106.5 R	3,893,866
209-211	3,893,922
264-261	3,894,024
310-053	3,894,138
235-193.5	3,894,212

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PATENTS

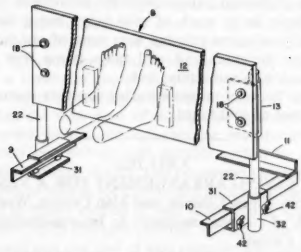
GRANTED JULY 8, 1975

GENERAL AND MECHANICAL

3,893,196
BODY IMPLANT MATERIAL
Robert F. Hochman, 3136 River Heights Dr., Smyrna, Ga. 30080
Continuation of Ser. No. 61,606, Aug. 6, 1970, abandoned. This application Oct. 11, 1972, Ser. No. 296,708
Int. Cl. A61f *1/20*
U.S. Cl. 3—1.91 **2 Claims**

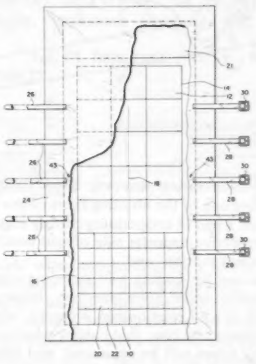
2. An orthopedic implant comprising a shaped composite with a longitudinally layered stem portion and including an organopolysiloxane presenting an outer surface that is inert to substances in the human body, and fibers included in the composite for reinforcement and within the outer surface and of the group consisting of graphite fibers and boron fibers, and with the fibers of one layer of the stem portion oriented longitudinally thereof and with the fibers of an adjacent layer oriented in a generally circumferential direction.

3,893,197
HOSPITAL BED FOOTBOARD ASSEMBLY
Maurine E. Ricke, 153 Smith Rd., Danville, Calif. 94526
Filed Feb. 11, 1974, Ser. No. 441,560
Int. Cl. A47c *21/00*
U.S. Cl. 5—327 R **4 Claims**



1. A foot support assembly for beds, comprising a pair of support brackets for mounting on opposite side rails of a bed frame, each support bracket including a channel member with an upper flange and a lower flange extending equally from a medial web and defining therebetween a cavity for receiving a side rail of the bed, a plurality of holes disposed in said web, at least one bolt received through one of said plurality of holes in said web and secured thereto for clamping the bed side rail between a portion of the head of said bolt and said web; each of said support brackets including a vertically disposed tubular member secured to said web; a pair of support arms each received in said tubular member and supported thereby, and a foot support member extending between said support arms and secured thereto.

3,893,198
MATTRESS FOR PREVENTING BEDSORES
E. Allan Blair, Princeton, N.J., assignor to Medic-Ease Corporation, Princeton, N.J.
Filed Mar. 29, 1972, Ser. No. 239,219
Int. Cl. A47c *23/00;* **A47g** *9/00*
U.S. Cl. 5—345 R **8 Claims**



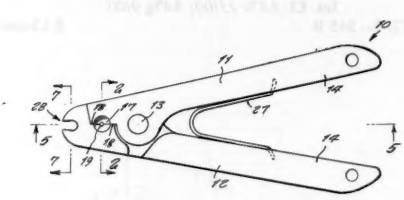
1. A mattress for the prevention of bed sores in a user comprising a unitary member made of resilient foam having a thickness greater than the thickness of an average user's body and having load-bearing properties wherein a 50 percent compression deflection pressure is substantially equal to the user's body weight divided by his body area in contact with the mattress, said mattress being subdivided upon its surface into a plurality of individual load-bearing units whereby said mattress absorbs the downward weight and lateral movement of the user's body to protect said user's body from contact with hard surfaces and from localized high pressure over the bony protuberances, a cover of flexible, waterproof and soft but strong fabric which is sized to cover the top and overlap, all edges of said mattress which is loose enough that it is not pulled tight when the user sinks deeply into the mattress, means for drawing at least two opposed edges of the cover tightly about the mattress so that the mattress is rendered firm enough to easily move a patient disposed thereupon, said drawing means includes a plurality of straps affixed to one edge of said cover and a plurality of buckles affixed to an opposed edge of said cover, said straps being extended thereunder, a shaft disposed beneath said mattress, said straps being wrapped about said shaft and means for rotating said shaft whereby the tension upon said straps may be adjusted in unison.

3,893,199
COMBINATION TOOL FOR WIRE CUTTING AND STRIPPING
Anthony Todaro, 47 Priscilla Ave., Deer Park, N.Y. 11729
Continuation-in-part of Ser. No. 373,861, June 26, 1973, abandoned. This application Sept. 20, 1974, Ser. No. 507,967
Int. Cl.[2] B25B *7/22;* **H02G** *1/12*
U.S. Cl. 7—5.6 **10 Claims**

1. A combination wire cutter and wire stripper comprising:

a pair of pivoted arms, said arms being positioned on opposite sides of a longitudinal center line passing through the pivot;

a pair of jaws each extending from a respective one of said arms, each of said jaws including a first portion located on the same side of the center line as does the arm from which that jaw extends, said first portions having aubtting faces, and a second portion extending onto the opposite side of the center line, said second portions each including an aligned notched section;



a pair of cooperating stripping edges each located on a respective one of the abutting faces of the first portion of said jaws, a pair of cooperating cutting edges each located on a respective opposite side of said notched sections of said second portion, and

biasing means for biasing said stripping edges in abutting relationship while simultaneously biasing said cutting edges in spaced relationship, whereby when force is applied against said bias, said cutting edges will cut and said stripping edges will be separated, and when the force is subsequently related said stripping edges will strip wire placed therein.

3,893,200

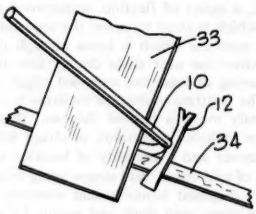
WRECKING BAR

Peter J. Wanciak, Seymour, Conn., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Nov. 4, 1974, Ser. No. 520,402

Int. Cl. B25f *1/00*

U.S. Cl. 7—12 **4 Claims**



1. An improved wrecking bar comprising a conventional straight bar having a handle at one end and terminating in a curved portion defining a hook shape, a curved working end with a support member having a working member formed at each end, said support member being joined to the straight bar near the general point of tangency of hook section to the straight section of the bar, said support member further extending along an axis generally perpendicular to the plane of the hook section and the axis of the straight section of the bar with the end thereof extending towards the direction of the handle.

3,893,201

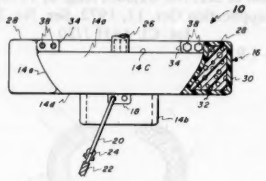
MULTI-BUOYANCY BUOY

Ray R. Mallory, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 25, 1974, Ser. No. 436,568

Int. Cl.² B63B *21/52*

U.S. Cl. 9—8 R **2 Claims**



1. A multiple bouyancy bouy comprising in combination:

a basic bouy for providing a first predetermined amount of positive bouyancy, said basic bouy comprising a hull that is circular in plan, has a substantially flat bottom surface of a first diameter, a substantially flat deck surface of a second diameter that is larger than said first diameter, and an annular side wall presenting a curved, sloping outer surface extending upwardly and outwardly from the periphery of said bottom surface to the periphery of said deck;

a plurality of arcuate flotation elements assembled in the form of a ring and embracing said basic bouy so as to provide additional bouyancy, each of said elements comprising only a segmental section of said ring and presenting a curved and sloping inner surface complimentary to and adjacent a corresponding portion of said sloping outer surface of said side wall, whereby upward movement of said ring relative to said basic bouy is precluded by cooperation between said outer and inner surfaces;

each of said flotation elements further comprising a plurality of tangs each extending radially inwardly from one end thereof in overlying relation to said deck, whereby said ring is prevented from downward movement relative to said basic bouy, each of said tangs being disposed in mutually adjacent relation to a tang of another of said flotation elements and said tangs being free of direct connection to said bouy; and

releasable fastener means securing together mutually adjacent ones of said tangs.

3,893,202

LIFE SAVING ARRANGEMENT FOR A VESSEL

William York Higgs, Gibsons, and Alan Cumyn, West Vancouver, both of Canada, assignors to Intercontinental Marine Limited, Canada

Filed June 24, 1974, Ser. No. 482,582

Claims priority, application Canada, June 26, 1973, 174970

Int. Cl. B63b *21/52*

U.S. Cl. 9—9 **14 Claims**

1. A life saving arrangement for a vessel, comprising:

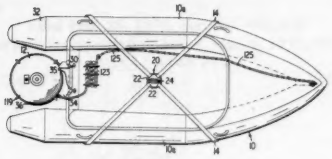
a. a buoy adapted to be releasably carried oy the vessel in such manner as to be released automatically should the vessel sink,

b. buoyant life support equipment also arranged to be releasably carried by the vessel,

c. releasable securing means normally securing said buoyant equipment to said buoy in close relationship and in such manner as to maintain said relationship when the buoy and the equipment are released from the vessel,

d. trip means for providing an interconnection between said securing means and the vessel, said trip means being arranged to cause release of said securing means after the

vessel has separated from the buoy by a predetermined amount sufficient for the buoy to be clear of any of the vessel fixtures or rigging, and

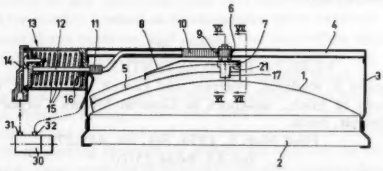


e. mooring means connecting said equipment to the buoy so that after release of said securing means the buoyant life saving equipment remains moored to the buoy.

3,893,203
DRIVE MOTOR FOR CLEANING GLASS SURFACES

Hans Berkelius, 36 Parkvagen, Taby, Sweden

Continuation of Ser. No. 314,072, Dec. 11, 1972, abandoned. This application Aug. 5, 1974, Ser. No. 495,020
Claims priority, application Sweden, Dec. 22, 1971, 16496
Int. Cl.[2] B60S *1/44;* **F01L** *21/04*
U.S. Cl. 15—250.22 **2 Claims**

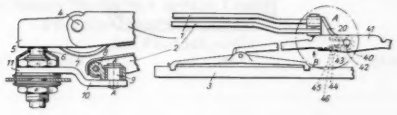


1. A drive motor for operating a cleaning device of the type having at least one wiper blade mounted for movement adjacent a glass surface to be cleaned and adapted to be driven by the drive motor across the glass surface to clean said surface, said drive motor comprising a hydraulic cylinder having a liquid inlet opening adjacent one end thereof and a liquid outlet opening adjacent the other end thereof, means for supplying liquid under pressure to said inlet opening and for receiving a return of liquid from said outlet opening, said liquid inlet opening having a flow area which is substantially greater than the flow area of said outlet opening, a slidable piston located within said cylinder for reciprocating movement, means connecting said slidable piston to said wiper blade of said cleaning device, said connecting means including rack and pinion means for converting reciprocating motion of said piston to rotary motion of said wiper blade, spring means between said piston and said cylinder for resiliently urging said piston toward said one end of said cylinder, said piston having a surface extending across said cylinder which surface is always in direct communication with said liquid inlet opening and continually exposed to the liquid under pressure at said inlet opening whereby said piston is movable against the restraint of said spring means toward said other end of said cylinder in response to forces exerted upon said piston by liquid pressure applied to said liquid inlet opening, said piston including an overflow passage extending therethrough for selectively equalizing the pressure on opposite sides of said piston, a valve member disposed adjacent said overflow passage, said valve member being operated by impact with a predetermined portion of said cylinder to open said overflow passage in response to movement of said piston in a working stroke from said one end to said other end of said cylinder, and said valve member thereafter being operated in the opposite direction by impact with a different portion of said cylinder to close said overflow passage in response to subsequent movement of said piston by said spring means in a return stroke from said other end to said one end of said cylinder, said overflow passage when open having a flow area substantially equal to the flow area of said liquid inlet opening and substantially greater than the flow area of said outlet opening, whereby the speed of movement of said piston is substantially the same during both said working stroke and said return stroke and is dependent upon the comparatively small flow area of said liquid outlet opening.

3,893,204
WINDSHIELD WIPER

Erich Kolb, Buhl-Eisental, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Oct. 10, 1973, Ser. No. 405,141
Claims priority, application Germany, Oct. 14, 1972, 2250509
Int. Cl. B60s *1/32, 1/40*
U.S. Cl. 15—250.23 **9 Claims**



1. A windshield wiper mechanism for a motor vehicle for use with a replaceable wiper blade, comprising:

a control bracket having a first arm (**22**) serving as a link member for pivotally holding said wiper blade, and

a power-driven wiper arm and a control arm both pivotally connected to said wiper blade by said control bracket so as to allow rotation of said wiper blade relative to said wiper arm,

said control bracket (**20**) being made of sheet metal and having a second arm (**21**) a portion of which separates the places at which said wiper arm and said control arm are respectively attached pivotally to said control bracket and having bent over tongues providing U-shaped portions at both said attachment places to hold respective mounting rivet members passing through said wiper arm and said control arm respectively and to provide, on the inside of the U-shape, a pair of opposed bearing surfaces (**25, 26**) of said control bracket, one of said pairs of surfaces engaging surfaces of said wiper arm and the other engaging surfaces of said control arm, said second arm (**21**) of said control bracket having a portion reversely bent, as seen from the side, between said attachment places, which portion includes a straight portion between mutually reverse bends.

3,893,205
COMPOSITE METAL MATERIAL AND ARTICLES MADE THEREFROM

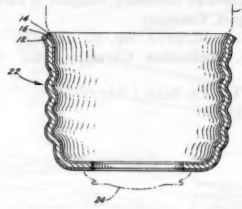
Ray B. Anderson, Attleboro, and Robert Baboian, North Attleboro, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

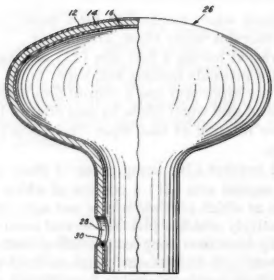
Filed Sept. 25, 1970, Ser. No. 75,388
Int. Cl. B32b *15/18;* **E05b** *1/06;* **H01k** *1/20*
U.S. Cl. 16—121 **8 Claims**

1. A lamp bulb base embodying a composite metal laminate material comprising a first layer of metal selected from the group consisting of copper, and copper alloys, a second layer of metal selected from the group consisting of aluminum and aluminum alloys, and an intermediate layer of steel sandwiched between and metallurgically bonded to said first and second metal layers, said layers of metal being coextensive in said composite material within said lamp bulb base, said second layer material being more anodic in the galvanic series of metals and alloys than the metals of said first and intermediate

metal layers and being preferentially corrosive in said composite material, said composite material being formed in a generally cup-shaped configuration with said first layer of said composite material disposed in exteriorly facing relation in said lamp bulb base and with said second, preferentially corrosive, metal layer disposed in an interiorly facing relation in said lamp bulb base.

5. A door knob embodying a composite metal laminate material, said composite material comprising a first layer of metal selected from the group consisting of copper, and copper alloys, a second layer of metal selected from the group consisting of aluminum and aluminum alloys, and an intermediate layer of steel sandwiched between and metallurgically bonded to said first and second metal layers, said layers of metal being coextensive in said composite material within said door knob, said second layer material being more anodic in a galvanic series of metals and alloys than the metals of said first and intermediate metal layers and being preferentially corrosive in said composite material, said composite material being formed into a generally ball-shaped configuration with said first layer of said composite metal material disposed in exteriorly facing relation in said door knob and with said second, preferentially corrosive, metal layer disposed in interiorly facing relation in said door knob.





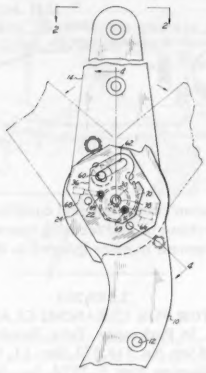
3,893,206

SEAT RECLINING ASSEMBLY

Joseph Pickles, Birmingham, and Chester S. Fudala, Detroit, both of Mich., assignors to Ferro Manufacturing Corporation, Detroit, Mich.

Filed Apr. 10, 1974, Ser. No. 459,632
Int. Cl. E05d *11/10*
U.S. Cl. 16—144 **19 Claims**

1. Seat back adjusting mechanism comprising a seat member, a seat back member, a pivot connection between said members, planetary gearing comprising a sun gear, planet gears, and an internal ring gear connected between said members, one of said gears being driven as an incidence of pivotal movement between said members, a ratchet gear fixed to said driven gear, and a locking pawl movable on one of said members into and out of engagement with said ratchet to block said ratchet gear and thereby to lock said seat back member in adjusted position.

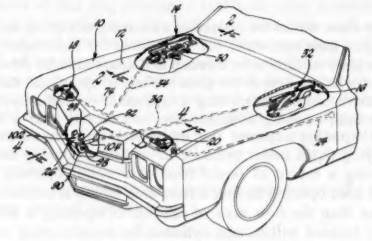


3,893,207

VEHICLE HOOD RETENTION DEVICE

Edward J. Rudaitis, Warren, and Lowell Ray Ulrich, Utica, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 8, 1974, Ser. No. 449,279
Int. Cl. B62d *25/10*
U.S. Cl. 180—69 C **5 Claims**

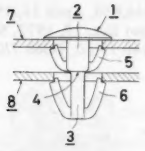


5. In a vehicle body having a compartment, a closure panel for closing a compartment, hinge means connecting one end of the closure panel to the body, and a latch for releasably latching the other end of the closure panel to the vehicle body, a retention device for retaining the one end of the closure panel comprising: a pin on the body extending upwardly and being inclined forwardly, the closure panel having an aperture in which the pin is received when the closure panel is in closed position to prevent substantial lateral or rearward movement of the closure panel, an apertured retaining plate pivotally mounted on the closure panel and closely surrounding the pin when the closure panel is in closed position, means biasing the apertured retaining plate to a normal position in which the retaining plate prevents substantial opening movement of the closure panel by engaging the pin, and means interconnecting the latch and the retaining plate for pivoting the retaining plate against the biasing means to a second position permitting opening movement of the closure panel by aligning the aperture of the apertured retaining plate with the pin to prevent engagement of the pin by the apertured retaining plate.

3,893,208
PLASTIC DEVICE FOR SPACING AND HOLDING TWO OR MORE PLATES

Takuo Yuda, Yokohama, Japan, assignor to Nifco Inc., Tokyo, Japan

Filed Feb. 28, 1974, Ser. No. 446,850
Claims priority, application Japan, Mar. 9, 1973, 48-28712
Int. Cl.[2] A44B 21/00
U.S. Cl. 24—73 P 3 Claims

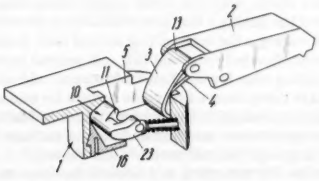


1. A plastic fastener for spacing and holding two or more plates each having a slot-like aperture with a predetermined width, comprising: a head portion; at least two adjacent shank portions each having a predetermined length the first of which has a relatively large cross-section and is integrally connected to and extending from said head portion and the other of which has a relatively smaller cross-section and is integrally connected to and extending from said first shank portion; a shoulder portion formed at the transition point between said adjacent shank portions; and at least one non-return element integrally connected to said first shank portion at the end opposite said head portion and to said second shank portion at the end opposite said shoulder portion, each said non-return element having a free end with all such free ends extending toward said head and each being adapted to yieldingly deform in passing through an associated aperture of one of said plates and return to its original form after passing through said aperture, each said non-return element being a diverging branch whose free end has a shoulder to catch the edge of said associated aperture, each of said shank shoulder portions having a transverse dimension equal to or less than the predetermined width of the slot in the plate through which it must pass but larger than the predetermined width of the slot in the next adjacent plate whereby said plates are retained in predetermined spaced relation controlled by the predetermined lengths of said shank portions.

3,893,209
HINGE FOR A PIECE OF FURNITURE

Gerhard Sewing, Lohne, and Jürgen Bachor, Kirchlengern, both of Germany, assignors to Paul Hettich & Co., Kirchlengern, Germany

Filed Oct. 24, 1973, Ser. No. 411,589
Claims priority, application Germany, Oct. 26, 1972, 2252497
Int. Cl.[2] E05D 3/06
U.S. Cl. 24—164 7 Claims

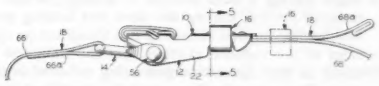


1. A hinge for a piece of furniture having a body and a door which is movable relative to said body between an open and a closed position, comprising a housing adapted to be recessed into said door and having a surface formed with a recess and with at least one lateral chamber open to said surface; a hinge arm mounted in said recess for movement about a pivot axis normal to its elongation and extending in part out of said recess and beyond said housing for connection with said body; a rocker member mounted in said recess for rocking movement about a rocking axis extending parallel to said pivot axis, said rocker member having a part projecting into said chamber and said rocker member having cam portions which project from the region of said rocking axis towards said pivot axis; and a spring received in said chamber and engaging said housing and said part, said spring being movable past a dead-center position between respective end positions in response to said door moving towards said open and closed positions, respectively.

3,893,210
STRAP CLAMP ASSEMBLY

William J. Hildebrandt, West Simsbury, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Sept. 16, 1974, Ser. No. 506,427
Int. Cl. A44b 11/06
U.S. Cl. 24—194 9 Claims



1. A strap clamp assembly having general utility comprising:

a. a buckle consisting of an elongated member having side flanges depending therefrom on at least two sides thereof, said elongated members having at least a pair of slots formed therein intermediate the ends thereof, said pair of side flanges each having a notched area formed therein intermediate the ends thereof;

b. a stirrup including a medial portion and a pair of arms extending outwardly from opposite ends of said medial portion;

c. mounting means operable for fastening said pair of arms of said stirrup to said side flanges of said buckle to enable said stirrup to pivot relative to said buckle between a release position and a clamping position;

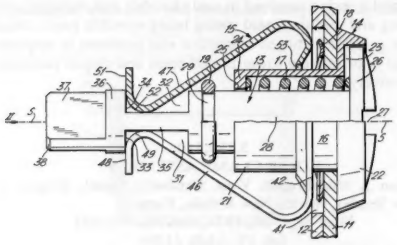
d. strap means operable for gripping an object and including a first portion having one end thereof secured to said stirrup for movement therewith and a second portion having one end thereof receivable in said pair of slots in said buckle for detachably connecting said one end of said second portion of said strap means to said buckle; and

e. a slide lock comprising a tubular member consisting of a first pair of side walls, a second pair of side walls connected to said first pair of side walls and a pair of opposed open walls, one of said first pair of side walls being inclined inwardly from the edges thereof towards the center thereof in the direction of the other of said first pair of side walls, said slide lock being supported on said strap means for movement between a release position wherein said slide lock is positioned in spaced relation to said buckle and a locking position wherein said slide lock is received in said notched areas of said pair of side flanges of said buckle and said one of said pair of side walls of said slide lock applies a biasing force to said buckle effective when said stirrup is in said clamping position thereof to hold said buckle and said strap means in clamped relation relative to each other so as to thereby prevent the accidental release of the strap clamp assembly.

3,893,211
STUD-AND-SOCKET FASTENER

Edward Albert Skinner, Hatfield, England, assignor to Aerpat A.G., Zug, Switzerland

Filed Feb. 5, 1974, Ser. No. 439,726
Claims priority, application United Kingdom, Feb. 5, 1973, 5695/73
Int. Cl. A44f 17/00
U.S. Cl. 24—221 K 6 Claims



1. A stud for use with a socket of the kind comprising two transversely extending abutments which are resiliently urged towards each other, said stud comprising:

a shank having a stem portion, a leading portion, and a reduced portion joining the stem and leading portions, said leading portion providing two shoulders on opposite sides of the reduced portion, and the thickness of the shank in the reduced portion being reduced in a transverse direction extending across the two shoulders, and

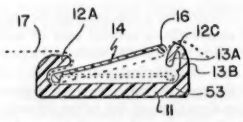
orientating means for orientating said stud relative to a socket when said stud is inserted within a socket,

whereby, when the stud is inserted into a socket of the said kind with such an angular orientation relative to the socket that the socket abutments will not engage the shoulders of the stud, said orientating means will engage and co-operate with a part of the socket before the reduced portion enters between the socket abutments so as to relatively reorientate the stud and the socket abutments so that the socket abutments can engage the shoulders of the stud.

3,893,212
DEVICE FOR MAKING LAP JOINTS FOR PLASTIC FILM AND THE LIKE

Walter J. Curry, 337 Roberta St., Winnipeg, Canada

Continuation-in-part of Ser. No. 379,815, July 16, 1973, abandoned. This application Oct. 16, 1973, Ser. No. 406,786
Int. Cl. A44b 21/00
U.S. Cl. 24—243 K 6 Claims

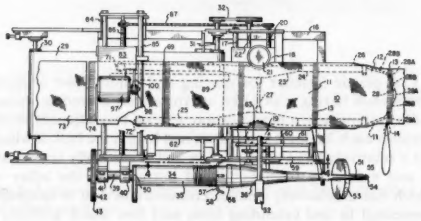


1. Apparatus for holding flexible plastic film in place comprising in combination an elongated flexible channel including a base and a pair of side walls overhanging the side edges of said base, an elongated flexible locking strip detachably engageable under said over hanging side walls, said locking strip including a web having a longitudinal edge on each side thereof, said edges engaging under said overhanging side walls and facing the base of said channel when installed, the associated flexible plastic film being sandwiched between the locking strip and said channel, one of said side walls including a downwardly extending edge portion, said edge portion being substantially flexible and being displaced outwardly when said locking strip is engaged, and moving back to the original position after said locking strip is installed.

3,893,213
METHODS FOR SEPARATING INTERCONNECTED SECTIONS OF TUBULAR KNITTED FABRIC

Murray L. Rockman, Plainview, and Andrew P. Cecere, Valley Stream, both of N.Y., assignors to Samcoe Holding Corporation, Woodside, N.Y.

Division of Ser. No. 244,050, April 14, 1972, Pat. No. 3,797,080. This application Dec. 19, 1973, Ser. No. 426,216
Int. Cl. D04b 19/00; D06h 7/02
U.S. Cl. 28—72 CS 3 Claims



3. A method for separating adjacent fabric sections of a tubular knitted fabric web in a continuous manner, said sections being connected together by a yarn transition transfer cord and a removable draw thread, the steps which comprise

a. continuously advancing said web of connected together sections in predetermined yarn cord alignment;

b. laterally distending said advancing web and effecting removal of successive draw threads therefrom;

c. maintaining said predetermined yarn cord alignment on one side of said advancing web;

d. accelerating the forward advance of said web sections after removal of said successive draw threads and releasing said distended fabric to partially separate said adjacent fabric sections to provide tapered spaced apart gaps therebetween; and

e. maintaining said accelerated forward advance of said partially separated web sections while severing said yarn cord sequentially between said adjacent sections as each successive tapered gap is formed.

3,893,214
MACHINE FOR MAKING EXPANDED METAL

David B. Parkinson, Cleveland Heights, Ohio, assignor to Gould Inc., Chicago, Ill.

Filed Aug. 15, 1973, Ser. No. 388,400
Int. Cl. B21d 31/02; B26d 1/10
U.S. Cl. 29—6.2 11 Claims

1. Apparatus for manufacturing expanded sheet stock comprising:

a. first and second knife means for shearing openings in flat sheet stock, said first knife means comprising an elongated bar having a first face defined by a plurality of teeth and having a flat intersecting second face, portions of an intersection between said first and second faces defining a cutting edge for said first knife means, said second knife means comprising a first guide surface for said sheet stock and a second guide surface for said second face, an intersection between said first and second surfaces defining a cutting edge for said second knife means;

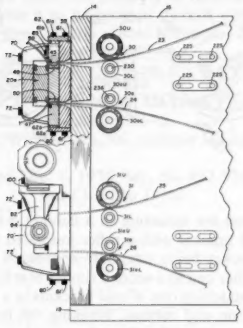
b. means for mounting said second face and said second guide surface in substantial planar alignment;

c. means defining third and fourth guide surfaces, said third guide surface being spaced from said first guide surface to also comprise a guide surface for said sheet stock, said

fourth guide surface being in substantially planar alignment with said second guide surface and being in face-to-face contact with said second face;

d. means for feeding said strip between said first and third guide surfaces and between said cutting edges; and

e. drive means for moving said first knife relative to said second knife in planar alignment therewith and in essentially simple harmonic motion recurringly along a curvilinear path to permit a rapid knife movement and reduce vibration in the apparatus and while said strip is fed there-



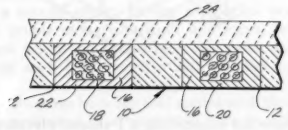
between so that any point on the cutting edge of a tooth sequentially shears said strip in a recurring sequence of point (1), to point (2), to point (*n*), where even-numbered points are spaced along a first line along the length of the strip, where the odd-numbered points are spaced on a second parallel line and are staggered with respect to said even-numbered points, and where said lines are spaced apart a distance substantially corresponding to one-half the distance between identically located points on adjacent teeth.

3,893,215

METHOD OF MANUFACTURING FACE PLATES WITH LARGE NUMBER OF CONDUCTING PATHS FROM ONE FACE TO THE OTHER

Tugrul Yasar, Madison Heights, Mich., assignor to The Bendix Corporation, North Hollywood, Calif.

Filed July 18, 1973, Ser. No. 380,517
Int. Cl. B01j *17/00*
U.S. Cl. 29—25.35 **9 Claims**



1. A method of manufacturing a face plate having a large number of conducting paths thereacross comprising

forming a disk of fused glass capillary arrays to a desired thickness, said disk having a large number of parallel pores extending from one face to the other,

depositing a layer of metal on said disk such that the inner walls of said pores are coated with metal,

cleaning and drying said disk,

heating said disk to approximately 470° C. and filling the coated pores with an inert sealant material capable of maintaining sealing integrity at temperatures over 300° C., and

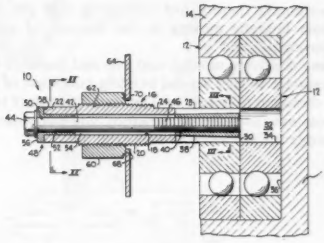
lapping the surfaces of said disk to provide a smooth glass surface with exposed metal contacts.

3,893,216

APPARATUS FOR EXTRACTING BEARINGS FROM A SUPPORTING STRUCTURE

Stephen R. Kushner, 3706 Vista View, Pittsburgh, Pa. 15122

Continuation-in-part of Ser. No. 400,124, Sept. 24, 1973, abandoned. This application June 26, 1974, Ser. No. 483,257
Int. Cl. B25b *27/06*
U.S. Cl. 29—265 **4 Claims**



1. Apparatus for extracting a bearing from a supporting structure comprising,

a cylindrical member having an axial bore therethrough and an externally threaded intermediate portion,

said cylindrical member having first end portion and a radially expandable second end portion positioned within the bore of the bearing,

a rod member having a threaded end portion axially positioned within said cylindrical member bore,

a sleeve member coaxially positioned within said cylindrical member bore, said sleeve member having a bore threadedly engaged to said rod member threaded end portion, said sleeve member being positioned in abutting relation with said cylindrical member bore and arranged to advance axially therein upon rotation of said rod member to urge said cylindrical member second end portion into frictional engagement with the bearing,

a fastening member threadedly engaged to said cylindrical member intermediate portion in spaced relation to said supporting structure and positioned for axial movement on said cylindrical member threaded intermediate portion, said fastening member having a bearing surface, and a brace member surrounding and rigidly supported independently of said cylindrical member threaded intermediate portion, said brace member having a bearing surface, said fastening member bearing surface being arranged to frictionally engage said brace member bearing surface.

3,893,217

SYSTEM AND METHOD FOR AUTOMATIC INSERTION OF PINS IN HOLES

James J. Edmond, Southfield, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Dec. 13, 1974, Ser. No. 532,531
Int. Cl. B23q *17/00*
U.S. Cl. 29—407 **2 Claims**

1. A system for inserting a pin into a member having a mating hole, at least one of said pin or hole being chamfered, said system comprising:

means positioning said pin and hole with their axes in approximate alignment such that said chamfer on said at

least one of said pin or hole is engaged with the other of said pin or hole;

means releasably holding one of said pin or member in a fixed orientation and fixing the position of the other of said pin or member;

means for relatively moving said pin and said member along a direction tending to insert said pin in said hole;

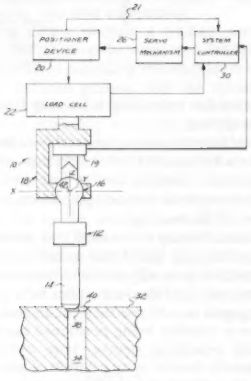
means sensing the lateral reactive force created by the interaction of said chamfer and the other of said pin or hole under the influence of said axial force;

means moving said pin and member laterally relative each other in directions tending to null said sensed reactive force;

means sensing a bending condition imposed on said pin by a jam condition of said pin in said hole due to misalignment of said pin and hole axes;

means releasing said releasable holding means holding said one of said pin or said member so as to allow free angular movement thereof but restraining said pin or member from laterally moving in the absence of such angular movement; and

means relatively moving said pin and member laterally in response to said sensed bending condition of said pin in a direction to relieve said jam condition until said pin and hole axes are aligned, whereby said pin enters said hole under the influence of said axial force.



2. A method for inserting a pin into a member having a mating hole, at least one of said pin or hole being chamfered, said method comprising the steps of:

positioning said pin and hole with their axes in approximate alignment such that said chamfer on said at least one of said pin or hole is engaged with the other of said pin or hole;

holding one of said pin or member in a fixed orientation and fixing the position of the other of said pin or member;

relatively moving said pin and said member along a direction tending to insert said pin in said hole;

sensing the lateral reactive force created by the interaction of said chamfer and the other of said pin or hole under the influence of said axial force;

moving said pin and member laterally relative each other in a direction tending to null said sensed reactive force;

releasing said one of said pins or said member so as to allow free angular movement thereof while restraining said pin or member from any lateral movement in the absence of such angular movement;

sensing any bending condition imposed on said pin by a jam condition of said pin in said hole due to misalignment of said pin and hole axes; and

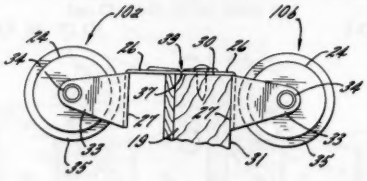
relatively moving said pin and member laterally in response to said sensed bending condition of said pin in a direction to relieve said jam condition until said pin and hole axes are aligned, whereby said pin enters said hole under the influence of said axial force.

3,893,218

METHOD OF MOUNTING CABINET DRAWER ROLLERS

Richard L. Bildahl, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.

Division of Ser. No. 249,700, May 2, 1972, Pat. No. 3,849,832.
This application May 16, 1974, Ser. No. 470,578
Int. Cl. B23p *17/00*
U.S. Cl. 29—413 **3 Claims**



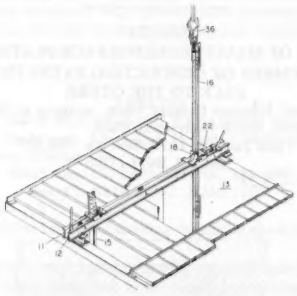
1. A method for mounting in a cabinet a roller assembly having a first bracket with a roller journaled thereon at one end, said bracket being integrally connected by a frangible web at the other end to a second similar bracket, said method comprising, attaching one of said brackets in a predetermined first position on said cabinet, breaking the frangible web to free the other of said brackets from said one bracket, and securing said other bracket in a second predetermined position on said cabinet.

3,893,219

APPARATUS AND METHOD FOR SUSPENDING ELEVATOR GUIDE RAILS

Meredith Reese Davis, Roselle, N.J., assignor to Otis Elevator Company, New York, N.Y.

Filed Aug. 1, 1974, Ser. No. 493,942
Int. Cl. B23p *19/04*
U.S. Cl. 29—429 **2 Claims**



1. Apparatus for suspending a T-shaped elevator guide rail in a hoistway shaft to enable it to be secured to one side thereof including;

a pair of mounting members spanning the top of said hoistway, in a direction substantially perpendicular to said one side, said members being separated laterally sufficiently to enable said guide rail to be suspended between them with the cross-piece of the T of said guide rail being disposed substantially perpendicularly to the longitudinal axis of said mounting members;

a guide unit for said guide rail secured to and mounted on said mounting members and having a slot disposed outwardly toward said one side of said hoistway for receiving the leg portion of the T of said suspended guide rail; and support means serving as a stop for said guide unit, said support means resting atop and spanning said mounting members and being resiliently secured to said guide unit on the outer side thereof for pressing against the back surface of the cross-piece of said suspended guide rail;

whereby a fish plate fixedly attached to the uppermost portion of said guide rail can be supported by said stop to suspend said guide rail in said hoistway;

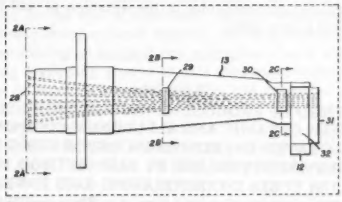
said mounting members and said guide unit being suitably located with respect to said one side of said hoistway to suspend said guide rail properly in relation to said one side to enable it to be secured thereto while remaining suspended from the top of said hoistway.

3,893,220

METHOD OF MAKING WIRE MATRIX PRINT HEAD NOZZLE

John R. Bittner, Waynesboro, Va., assignor to General Electric Company

Filed Aug. 1, 1974, Ser. No. 493,974
Int. Cl. B23p *19/04*
U.S. Cl. 29—433 **4 Claims**



1. A method for manufacturing a wire matrix print nozzle wherein said nozzle comprises a block of plastic material with a plurality of holes extending throughout its length from a wire driving end to a wire driven end and adapted for receiving a plurality of elongated print wires for sliding movement therein such that the ends of the wires at their driven ends can impact a record medium through an inked ribbon comprising:

a mold having a wire driving end guide and a wire driven end guide,

said driving end guide having wire holes positioned at space points along an oval locus in a first plane,

said driven end guide having wire holes positioned at spaced points along a line in a second plane substantially parallel to said first plane,

locating a first insert, having wire holes positioned at spaced points along an oval locus, intermediate said guides and with the plane of such locus substantially parallel to said first plane,

locating a second insert, having wire holes positioned at spaced points along a straight line locus, intermediate said first insert and said driven end guide and with the plane of such locus substantially parallel to said first plane,

inserting core wires between said guides such that each core wire is positioned in a respective hole in a driving end guide, passes through a respective hole in said first insert, passes through a respective hole in said second insert and is positioned in a respective hole in said driven end guide, causing plastic to be molded around the wires and between said guides and to said first insert,

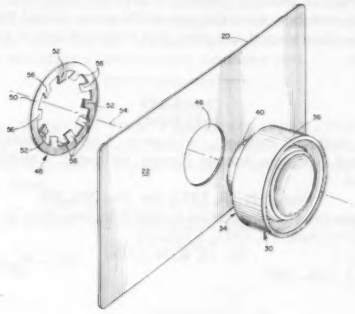
and removing said second insert from the molded plastic to leave unsupported by plastic that portion of the length of each core wire shielded by the second insert during the molding operation thereby providing an antiwicking region for minimizing ribbon ink flow in the holes of the nozzle.

3,893,221

LENS ASSEMBLY MOUNTING METHOD AND APPARATUS

Walter G. Lehmann, Somerville, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 26, 1973, Ser. No. 427,582
Int. Cl. B23p *11/02*
U.S. Cl. 29—453 **10 Claims**



1. A method of assembling at least first and second components, said first component being provided with a first aperture, with a retaining member, said retaining member having a planar peripheral portion and a plurality of coplanar first tabs defining a second aperture and a plurality of second tabs resiliently connected to said peripheral portion and extending in a direction away from the plane of said peripheral portion comprising the steps of:

inserting said second component at least partly through said first aperture in said first component;

inserting said second component through said second aperture in contact with at least one of said first tabs to locate said retaining member with respect to said second component;

further inserting said second component through said second aperture and into engagement with said second tabs whereby said second tab members are caused to resiliently move away from said plane and admit said second member therebetween so as to prevent the withdrawal thereof; and

bringing said retaining member into abutment with said first component.

3. In combination with a photographic camera of the type including a shutter housing having a generally planar forward wall portion with a first circular aperture therethrough, means for securing a photographic objective lens assembly to said housing, including:

a lens housing assembly having at least one lens element secured therewithin, said housing assembly having a first cylindrical portion having a diameter slightly smaller than said first aperture whereby said first portion may snugly pass through said first aperture, said first portion extending through said first aperture, said housing assembly having a second cylindrical portion having a diameter larger than said aperture so that it cannot pass therethrough in abutment with said wall portion; and

a retaining member of a dimension unable to pass through said aperture and having means defining a variable aperture therethrough, positioned over said first portion in abutment with the opposite side of said wall portion from said second portion; said variable aperture defining means engaging and gripping said first portion such that any force tending to move said second portion out of

abutment with said wall portion will cause said aperture defining means to exert an increased grip on said first portion to secure said lens housing to said shutter housing, said retaining member comprising a generally planar ring having a rotational axis of symmetry, said retaining member including locating means for registering said retaining member with respect to said first portion to facilitate the positioning of said retaining member over said first portion, said locating means comprising a plurality of first tab members extending inwardly to define a circular aperture of diameter slightly larger than that of said first portion, and said variable aperture defining means including a plurality of inwardly extending second tab members extending out of the plane of said ring in a direction toward and along said rotational axis of symmetry.

3,893,222

WELDING

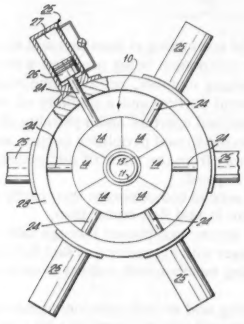
Hugh Anthony Ballinger, Abingdon, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed July 25, 1973, Ser. No. 382,299

Claims priority, application United Kingdom, July 26, 1972, 34952/72; Nov. 17, 1972, 53384/72

Int. Cl. B23k *27/00*

U.S. Cl. 228—107 **28 Claims**



1. A method of welding a first component to a second component by accelerating it towards, and impacting it into, the second component, the method comprising the steps of locating an explosive charge adjacent the first component, positioning, adjacent the side of the second component that is remote from the first component, an anvil which is so shaped and dimensioned and of such mass that it supports the second component against the forces generated by the explosion, and is only accelerated away from the second component by the stored energy in the anvil after the weld between the first and second components is completed, and detonating the explosive charge.

3,893,223

HIGH FREQUENCY VIBRATORY SPOT WELDING OF SHEET METAL

Bruce L. Mims, Redding, Conn., assignor to Branson Instruments, Incorporated, Stamford, Conn.

Filed Nov. 29, 1973, Ser. No. 420,065

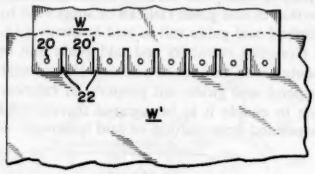
Int. Cl.[2] B23K *21/00*

U.S. Cl. 228—110 **13 Claims**

1. The method of spot welding two sheet metal members by vibratory energy comprising:

providing one of said members with means for causing said member to have spaced locations which are substantially vibration isolated from each other with respect to high frequency vibratory energy propagated from one such location along the plane of said member toward an adjacent location;

disposing said members in overlapping position for causing said locations of said one member to be in contact with the other member, and



while providing a compressive force between a selected one of said locations and the overlapping portion of the other member, applying to said selected location high frequency vibratory energy having a major component substantially perpendicular to the direction of said force to cause a spot weld.

3,893,224

METHOD OF PRODUCING VACUUM-TIGHT SEALS BETWEEN CERAMIC AND ALLUMINUM COMPONENTS, EVACUATED ENVELOPES INCORPORATING THE COMPONENTS SEALED BY SAID METHOD, AND VACUUM TUBES INCORPORATING SAID ENVELOPES

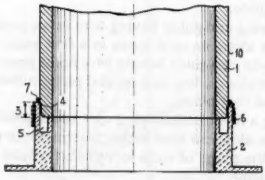
André Besson, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Oct. 31, 1972, Ser. No. 302,416

Claims priority, application France, Nov. 5, 1971, 71.39796

Int. Cl. B23k *31/02*

U.S. Cl. 228—124 **4 Claims**



1. A method of manufacturing vacuum-tight seals between ceramic and aluminium components, comprising the steps of metallizing, the ceramic component over at least part of a contact zone between the ceramic component and the aluminium component;

positioning the aluminium component on the ceramic component;

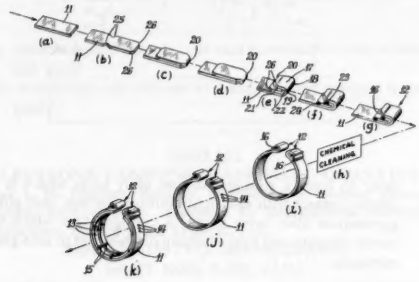
positioning, at the junction between the two components, an appropriate quantity of brazing solder made of a eutectic mixture of Al-Si containing 89% of aluminium and 11% of silicon; and

heating to 580°C in a controlled, reducing or neutral atmosphere.

3,893,225
METHOD FOR MAKING A BAND BRAKE

Oscar Hamrick, Elmwood, and Orville E. Kessinger, Jr., Mackinaw, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 304,083, Nov. 6, 1972, Pat. No. 3,811,542.
This application Nov. 19, 1973, Ser. No. 416,754
Int. Cl. B23k *31/02*
U.S. Cl. 228—173 10 Claims



1. In a method for forming a band brake, including forming an anchor on the end of a metallic, flexible strip adapted to have a brake lining secured thereon, the steps comprising

reverse folding an internal end extension of said strip,

forming a gripping groove of said extension, including the step of again reverse folding the end extension of said strip to form superimposed outer and first and second inner portions, and

securing said first and second inner portions together by a weld bead, extending at least substantially across the transverse width of said strip.

7. A method forming a band brake comprising the steps of reverse folding each integral end extension of a metallic, flexible strip,

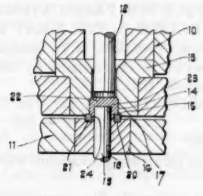
forming a gripping groove on each of said end extensions, forming said strip into an annular band by grasping ends thereof and stretch-forming said strip about an annular mandrel, and

thereafter securing a segmented brake lining to the formed annular inner surface portions of said band to form a band brake.

3,893,226
METHOD OF MAKING SEMI-CONDUCTOR MOUNTS

John S. Waite, Barbicon near Welshpool, Wales, assignor to GKN Floform Limited, Welshpool, Wales

Continuation of Ser. No. 279,867, Aug. 11, 1972, abandoned.
This application Feb. 8, 1974, Ser. No. 440,801
Int. Cl. B23k *31/02;* B21d *31/00*
U.S. Cl. 228—170 13 Claims



1. A method of making a mount for a solid state semiconductor comprising the steps of successively

positioning a blank adjacent to and centrally aligned with the opening in an annular mounting part for a cover,

applying pressure to the blank to cause plastic deformation of said blank to form said blank into a mount body of predetermined configuration, said deformation including radially outward movement of part of the blank to bring said blank into contact with a planar surface of the surrounding mounting part,

continuing the pressure against said blank and exerting pressure against said mounting part, said pressure being sufficient to shear off surface portions of said blank and mounting part, thereby exposing new uncontaminated surfaces in contact with each other,

then heating said body and mounting part while maintaining said contact to cause bonding between said new surfaces,

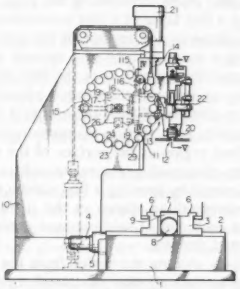
then mounting said semiconductor on said body, and

then mounting a cover on said mounting part.

3,893,227
AUTOMATIC TOOL CHANGING APPARATUS

Noboru Suzuki, Aichi-ken, and Yozu Kamiya, Anjo, both of Japan, assignors to Toyoda Machine Works, Limited, Aichi-ken, Japan

Filed Aug. 9, 1973, Ser. No. 387,002
Claims priority, application Japan, Aug. 31, 1972, 47-87368
Int. Cl. B23q *3/157*
U.S. Cl. 29—568 7 Claims



1. An automatic tool changing apparatus adapted for application to a machine tool having a vertical spindle comprising:

a rotatable tool storage magazine adapted for removably storing a plurality of horizontally disposed tools, said tool storage magazine being horizontally retractable, and including means for allowing said desired tool to be removed by an intermediate tool transfer device when said tool storage magazine is retracted;

said intermediate tool transfer device being adapted for removing a desired tool from the plurality of tools in the tool storage magazine by horizontal motion thereof from said tool storage magazine and for subsequently positioning an axis of the tool in parallel with an axis of the vertical spindle in a position adjacent to the vertical spindle of the machine tool by downward pivotal motion thereof through 90°; and

a tool transfer device of exchanging the desired tool in the intermediate tool transfer device for an already used tool held in said vertical spindle, wherein each of said plurality of tools being stored in said tool magazine is held in a tool sleeve having vertically spaced recesses, and wherein said means of said tool storage magazine comprises vertically disposed and horizontally spaced front and rear magazine plates having a plurality of paired support seats disposed equiangularly on the peripheries of said magazine plates for supporting said plurality of tools, said seats of said front magazine plates having openings, with one of which

vertically spaced recesses of a tool sleeve holding the desired tool are aligned when the tool sleeve is clamped by said intermediate tool transfer device and, said tool magazine is retracted so that said tool sleeve together with said desired tool is free to pass through said opening.

3,893,228

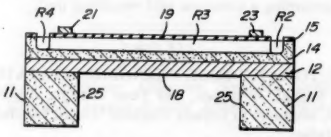
SILICON PRESSURE SENSOR

William L. George, and Jack L. Saltich, both of Scottsdale, Ariz., assignors to Motorola, Inc., Chicago, Ill.

Division of Ser. No. 293,958, Oct. 2, 1972, abandoned. This application Oct. 29, 1973, Ser. No. 410,734

Int. Cl. B01j *17/00*

U.S. Cl. 29—580 **7 Claims**



1. A method of manufacturing a silicon pressure sensor from a monocrystalline silicon wafer cut along a prescribed crystallographic plane, comprising the steps of:

a. forming a first layer of a first conductivity type moncrystalline silicon at one surface of the wafer;

b. forming a second layer of a second conductivity type monocrystalline silicon over the first layer;

c. forming at least one elongated piezoresistive pressure sensitive element of the bridge circuit by forming a first conductivity type section of monocrystalline silicon in a prescribed region at the surface of the second layer;

d. forming elongated pressure insensitive elements of the bridge circuit by forming a first conductivity type section of monocrystalline silicon at the surface of the second layer at each end of said pressure sensitive element and connected thereto;

e. selectively etching the wafer from the other surface to provide a relatively thin elongated region to support the piezoresistive pressure sensitive element of the bridge circuit while leaving unetched spaced portions of the wafer underlying the pressure insensitive elements to provide a relatively thick region to support the pressure insensitive elements of the bridge circuit; and

f. interconnecting the elements of the bridge circuit to produce an output when the pressure sensitive element is subjected to pressure.

3,893,229

MOUNTING FOR LIGHT-EMITTING DIODE PELLET AND METHOD FOR THE FABRICATION THEREOF

Alanson D. Aird, North Syracuse, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Oct. 29, 1973, Ser. No. 410,640

Int. Cl. B01j *17/00*

U.S. Cl. 29—589 **13 Claims**

1. A method for mounting a gallium arsenide light-emitting diode pellet having a light-emitting surface to a glass substrate, the method comprising the steps of:

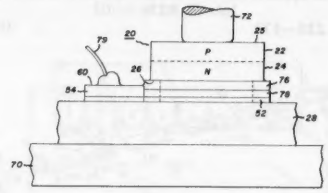
a. forming a titanium layer on said glass substrate;

b. forming a gold layer on said titanium layer to form a gold-titanium layer, said gold-titanium layer being in a pattern which exposes a portion of said glass substrate;

c. forming a germanium layer on said gold-titanium layer, said layer of germanium covering a portion of said gold-titanium layer proximate to said exposed portion of said glass substrate;

d. placing said light-emitting diode pellet on said germanium layer with said light-emitting surface in contact therewith so that a portion of said light-emitting surface overlies said exposed portion of said glass substrate; and

e. bonding said light-emitting diode pellet to said germanium layer under pressure at a temperature and for a time sufficient to cause said gold layer and said germanium



layer to form a gold-germanium alloy layer which is in ohmic contact with said light-emitting surface, said gold-germanium alloy layer having a configuration which securely mounts said light-emitting diode pellet to said glass substrate.

3,893,230

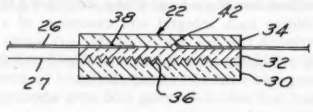
METHOD OF MANUFACTURE OF AN EXHAUST GAS SENSOR FOR AN AIR-FUEL RATIO SENSING SYSTEM

Henry L. Stadler; Tseng-Ying Tien, both of Ann Arbor; Michael J. Esper, Detroit, and Donald J. Romine, Southfield, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 198,515, Nov. 15, 1971, abandoned. This application Aug. 23, 1973, Ser. No. 391,424

Int. Cl. G01n *29/02*

U.S. Cl. 29—592 **6 Claims**



1. A process for preparing an exhaust gas sensing member comprising the steps of

forming a slurry of a major portion of particles of a transition metal oxide;

drying the slurry into a sheet;

forming plates from the dried slurry;

sandwiching spaced electrodes between a pair of said plates; and

firing the sandwiched plates into a unitary structure.

3,893,231

TECHNIQUE FOR FABRICATING VACUUM WAVEGUIDE IN THE X-RAY REGION

John P. Anderson, Peekskill, N.Y., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 19, 1974, Ser. No. 534,331

Int. Cl.[2] H01P *11/00*

U.S. Cl. 29—600 **3 Claims**

1. A method of fabricating a vacuum waveguide comprising the steps of:

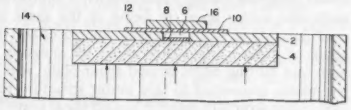
a. selecting an optionally flat substrate;

b. depositing a film of metal on said substrate;

c. photoetching a line corresponding to the width of said waveguide in said metal film;

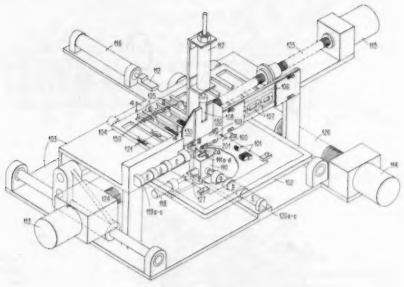
d. selecting a parylene pellicle;

e. depositing a second metal film on one side of said pellicle;
f. depositing a third film perpendicular to the length of the waveguide on the opposite side of said pellicle;



g. stretching said pellicle over said substrate to form a channel; and
h. evacuating said channel to complete said vacuum waveguide.

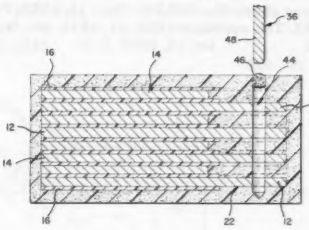
3,893,232
ELECTRONIC COMPONENT ASSEMBLY APPARATUS
Alan T. M. Fletcher, Boulder, and Robert J. Godsoe, Jamestown, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Aug. 16, 1973, Ser. No. 389,057
Int. Cl. H05k *13/04, 13/02*
U.S. Cl. 29—626 **14 Claims**



7. Apparatus for inserting different size modules, each having a plurality of leads lying in a plane extending from a first side of the module, into a circuit board, including:
a number of positionable magazines, each magazine retaining a stack of essentially identically dimensioned modules positioned with their leads parallel with each other and also with lines perpendicular through the circuit board;
a movable guide, supported adjacent a first top side of the circuit board, positionable to contact at least one side of a module;
a plurality of anvils, mounted in an indexable anvil support adjacent a second side of the circuit board, positionable to present a selected anvil, in line with the movable guide, having dimensions corresponding to dimensions of a module; and
means for relatively moving the module and anvil support toward each other to place a module into the circuit board and crimp less than all of said module leads against a side of the board to remain within aforesaid plane.

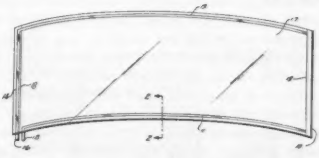
12. A method for inserting different size modules, each having more than two leads emerging from a first side of the module, into holes in a circuit board, including the steps of:
retaining a stack of essentially identically dimensioned modules in magazines so that their leads are parallel with each other and also with lines perpendicular through the circuit board holes;
exerting a positive force on the end of one stack of modules to force a module at the other end of the stack out of the magazine and through an associated aperture;
selecting an anvil having dimensions corresponding to dimensions of the module forced out of the magazine; and
relatively moving the forced module and the selected anvil to crimp less than all of the module leads against the board bottom.

3,893,233
METHOD OF CONNECTING A CONTACT PIN TO LAMINATED BUS BARS
Douglas Wade Glover, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Continuation-in-part of Ser. No. 152,145, June 11, 1971, abandoned. This application Sept. 18, 1972, Ser. No. 290,013
Int. Cl.[2] H01R *43/00;* **H05K** *1/04*
U.S. Cl. 29—628 **6 Claims**



1. A method of making electrical connection to a laminated bus bar assembly having alternate layers of rigid insulator material and electrically conductive material, comprising
forming an aperture of uniform dimensions in the assembly to a predetermined depth normal to the lamina and extending through predetermined adjacent ones of said lamina,
driving into the aperture of the assembly a conductive post having angularly related walls biting into the aperture wall including that of the conductor and distorting the material of the conductor layer in its own plane while the remainder of the post walls are within the aperture and spaced from the wall thereof,
prior to the step of driving said post into the aperture of the assembly, placing a globule of uncured epoxy on one of the post and entrance to the aperture of the assembly to fill the space between the post and aperture walls,
and allowing said epoxy to cure subsequent to driving the post into the aperture.

3,893,234
EDGE IMPROVEMENT FOR WINDOW WITH ELECTRICALLY CONDUCTIVE LAYER
Berton P. Levin, Santa Monica, Calif., assignor to The Sierracin Corporation, Sylmar, Calif.
Division of Ser. No. 268,827, July 3, 1972, Pat. No. 3,781,524. This application Aug. 29, 1973, Ser. No. 392,741
Int. Cl. H01r *43/00*
U.S. Cl. 29—628 **6 Claims**



1. A method for improving an edge of an electrically conductive window having a glass ply, a transparent plastic carrier film, a thin conductive coating on one face of the carrier film, and a transparent plastic interlayer bonding the glass ply to the

face of the carrier film having the conductive coating thereon comprising the step of:

providing a transparent plastic carrier film having a thin conductive coating extending over substantially all of one face thereof; and

removing the conductive coating from an edge portion of the carrier film by mechanically abrading the edge portion.

3,893,235

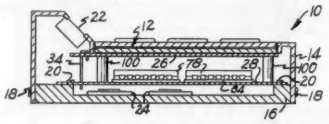
KEYBOARD ELECTRONIC APPARATUS AND METHOD OF MAKING

Laurence J. Keough, Walpole, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 307,706, Nov. 17, 1972, Pat. No. 3,831,063. This application Feb. 11, 1974, Ser. No. 441,072

Int. Cl. H05k *3/20*

U.S. Cl. 29—628 **6 Claims**



1. Method for electrically interconnecting a plurality of circuit paths on two printed circuit boards comprising the steps of blanking a strip of electrically-conductive metal material to form a plurality of shape-retaining leads held in spaced side-by-side parallel relation to each other by integral web portions of said strip material, inserting corresponding first ends of said leads into respective, correspondingly spaced apertures in a first rigid printed circuit board to dispose said first lead ends adjacent selected circuit paths on said first printed circuit board, soldering said first lead ends in electrically connected relation to said selected circuit paths for further securing said leads in said spaced, side-by-side parallel relation to each other, removing said strip web portions from said leads for separating said leads while retaining said leads in said spaced side-by-side parallel relation to each other in said first printed circuit board, inserting the opposite ends of said spaced leads into respective, correspondingly spaced apertures in a second rigid printed circuit board to dispose said opposite lead ends adjacent selected circuit paths on said second printed circuit board, and soldering said opposite lead ends in electrically connected relation to said selected circuit paths on said second printed circuit board.

3,893,236

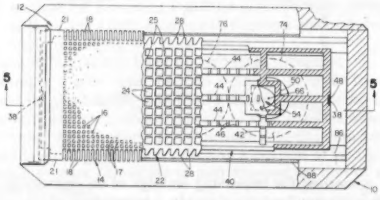
DRY SHAVER

Warren I. Nissen, Topsfield, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Nov. 11, 1974, Ser. No. 522,348

Int. Cl. B26b *19/00*

U.S. Cl. 30—43 **17 Claims**



1. A dry shaver comprising:

a shear plate having a multiplicity of apertures therein, each said shear plate aperture being of polygonal configuration and defining a series of cutting edges thereabout;

cutter structure against one side of said shear plate, said cutter structure having a multiplicity of apertures therein, each said cutter aperture being of the same polygonal configuration as said shear plate apertures and defining a series of cutting edges thereabout for shearing coaction with said cutting edges in said shear plate; and

drive means connected to said cutter structure for driving said cutter structure relative to said shear plate for shearing coaction between cooperating cutting edges of apertures of said shear plate and said cutter structure;

said drive means has means for driving said cutter structure along a path of the same polygonal configuration as that of said apertures in said shear plate and said cutter structure.

3,893,237

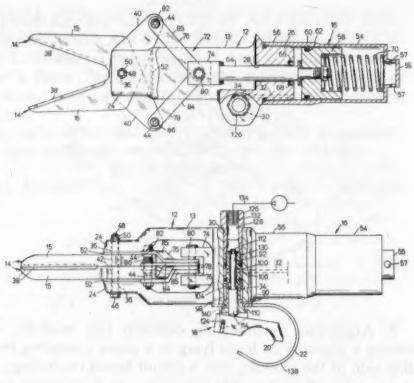
POULTRY CUTTER

Donald E. Jahnke, 6116 N. 115th St., Menomonee Falls, Wis. 53051

Filed Aug. 3, 1973, Ser. No. 385,437

Int. Cl. B26b *15/00*

U.S. Cl. 30—228 **3 Claims**



1. An improved hand held poultry cutter comprising:

a housing having a pair of arms,

a pressure passage extending through said housing transversely to said arms,

a pair of cutter blades pivotally mounted on said arms on one side of said pressure passage,

said blades having straight cutting edges and rearwardly extending arms,

a pneumatic piston and cylinder assembly mounted on said housing on the other side of said pressure passage,

said assembly including a piston rod,

linkage means for operably connecting said piston rod to said rearwardly extending arms,

means for biasing said piston rod to hold the blades in an open position,

a trigger actuated air control mechanism located in said pressure passage for selectively pressurizing said piston and cylinder assembly to close said blades, said trigger actuated air control mechanism including an air valve body having an axial passage,

means for connecting one end of said axial passage to a source of air under pressure,

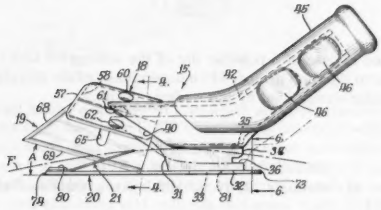
port means for connecting said axial passage to said cylinder,

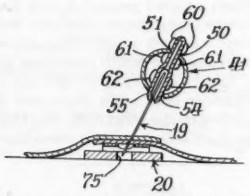
an air valve plunger positioned in said axial passage in said body and including an O-ring on each end of said plunger

for selectively sealing one or the other of the ends of said axial passage whereby said port means is connected to said air under pressure or vented to atmosphere, said plunger being moved to a closed position by the pressure of the air at said one end of said axial passage,

a trigger pivotally mounted on said housing in a position to move said plunger to an open position with respect to said one end of said axial passage to pressurize said piston and cylinder assembly and to close the other end of said axial passage, said trigger being located in a position to be actuated when the cutter is held by the cylinder assembly, and a guard for preventing accidental actuation of said trigger actuated mechanism.

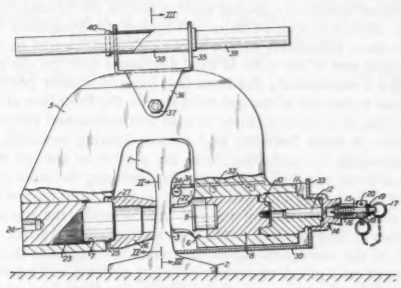
3,893,238
BUTT SEAM CUTTING TOOL
Albert S. Scholl, 2706 S. Kedvale, Chicago, Ill. 60623
Filed Nov. 2, 1973, Ser. No. 412,188
Int. Cl.[2] B26B *3/08, 29/02*
U.S. Cl. 30—294 **2 Claims**





1. A hand operated tool for cutting angulated butt seam edges in wall covering materials and the like comprising: an elongated planar guide shoe formed with an opening therethrough and having a bottom planar guide surface engageable with an underlying wall to guide the tool in its normal operating position, a generally planar body member affixed to said guide shoe adjacent one end thereof such that the plane of said body member lies in acute angular relation to the plane of said guide shoe and guide surface, an elongated arm portion formed on said body member in overhanging spaced alignment with the longitudinal axis of said guide shoe and opening such that the longitudinal axis of said arm portion intersects the plane of said guide shoe and guide surface; holder means affixed to said arm portion and comprising a pair of parallel spaced wall portions for slidably receiving and holding a cutting blade in the plane of said body member, a cutting blade frictionally mounted in said holder means and having a first cutting edge in the plane of said body member and parallel to the longitudinal axis of said arm portion to subtend in bi-angular intersecting relationship with the plane of said guide surface, said cutting edge invading said opening rearwardly of the leading other end of said guide shoe to interferingly engage sheet materials passing over the latter, whereby movement of the tool through said material serves to feed material over the leading end of said guide shoe and against said cutting edge to sever the same in a plane disposed in acute angular relationship to the formational plane of said sheet material, a secondary cutting edge formed on a lateral margin of said blade, in intersecting relationship with said first cutting edge and adapted for use in an inverted operating position for the tool, and additional guide means formed on the outer end of said holder means for locating the second cutting edge in a plane of angularity coincident with the plane of severance effected by said first cutting edge.

3,893,239
EXPLOSIVELY ACTUATED RAIL PUNCH
Joseph L. Giebel, Pittsburgh, and Frank K. Hill, Irwin, both of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.
Filed Jan. 7, 1974, Ser. No. 431,219
Int. Cl. B26f *1/00*
U.S. Cl. 30—358 **4 Claims**



1. A tool for punching an inclined hole through the upwardly tapered portion of the web of a track rail, comprising a yoke adapted to straddle the rail and having ends for extending down beside its opposite sides, a hollow die between said ends carried by one of them and having a substantially flat front face, explosively driven punching means carried by the opposite end of the yoke in axial alignment with the die and having a substantially flat front face lying in a plane perpendicular to the axis of the punching means, the front face of the die lying in a plane inclined to said first-mentioned plane to provide a space between said planes tapering upwardly to substantially the same degree as the portion of the rail web that is to be punched, and a threaded member screwed into said one end of the yoke and having a projecting inner end engaging and supporting said die, said member being rotatable to move the die toward the punch for clamping the yoke onto a rail with the top and bottom of the inclined front face of the die engaging one side of the rail web, and the yoke and die having engaging surfaces that prevent rotation of the die when said threaded member is turned, whereby the top and bottom of the front face of the punching means will strike the web at the same time when the punching means is driven forward.

2. A tool for punching an inclined hole through the upwardly tapered portion of the web of a track rail, comprising a yoke adapted to straddle the rail and having ends for extending down beside its opposite sides, a hollow die between said ends carried by one of them and having a substantially flat front face, explosively driven punching means carried by the opposite end of the yoke in axial alignment with the die and having a substantially flat front face lying in a plane perpendicular to the axis of the punching means, the front face of the die lying in a plane inclined to said first-mentioned plane to provide a space between said planes tapering upwardly to substantially the same degree as the portion of the rail web that is to be punched, said opposite end of the yoke having a portion projecting toward said one end of the yoke for engaging a rail web when the yoke is clamped onto it, means for clamping the yoke onto a rail with the top and bottom of the inclined front face of the die engaging one side of the rail web

so that the top and bottom of the front face of the punching means will strike the web at the same time when the punching means is driven forward, a guard straddling said opposite end of the yoke and having two side walls and a bottom wall, the guard being movable forward from a rear inoperative position to a forward guarding position beside said projecting portion of the yoke, a cartridge-receiving member carried by the rear end of said opposite end of the yoke, a firing pin behind said member, and a breech block carrying the firing pin and adjustable forward relative to said member to move said pin from a rear inoperative position to a forward operative position, the breech block being engageable with said guard to move the guard forward to its guarding position when the breech block is adjusted forward to the operative position of the firing pin, whereby the tool cannot be operated until the guard is in its guarding position.

3. A tool for punching an inclined hole through the upwardly tapered portion of the web of a track rail, comprising a yoke adapted to straddle the rail and having ends for extending down beside its opposite sides, a hollow die between said ends carried by one of them and having a substantially flat front face, explosively driven punching means carried by the opposite end of the yoke in axial alignment with the die and having a substantially flat front face lying in a plane perpendicular to the axis of the punching means, the front face of the die lying in a plane inclined to said first-mentioned plane to provide a space between said planes tapering upwardly to substantially the same degree as the portion of the rail web that is to be punched, and means for clamping the yoke onto a rail with the top and bottom of the inclined front face of the die engaging one side of the rail web, whereby the top and bottom of the front face of the punching means will strike the web at the same time when the punching means is driven forward, said punching means including a piston and a punch carried by the front end of the piston, the front face of the piston being parallel to the front face of the punch, said opposite end of the yoke being provided with a passage therethrough containing said piston, said opposite end of the yoke also having portions at opposite sides of said passage projecting toward said die for engaging a rail web when the yoke is clamped onto it, the inner surfaces of said projecting portions forming continuations of the wall of said passage to guide the piston when it is driven forward.

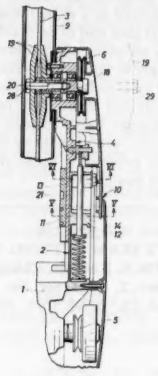
3,893,240

PORTABLE CUTTING-OFF IMPLEMENT

Bengt Morner, Ryetvagen 9, Hovas, and Bengt Wallin, Hagmarksgatan 7, Goteborg, both of Sweden

Filed June 3, 1974, Ser. No. 476,072
Claims priority, application Sweden, July 9, 1973, 7309602
Int. Cl. B26d *1/14;* **B24b** *23/02*
U.S. Cl. 30—390 **4 Claims**

1. Portable cutting-off implement with a body (1), which comprises a driving motor and from which an arm (2, 4) extends, of which the outer end is provided with a shaft means (18) arranged to be driven by the rotation from the driving motor, said shaft being provided with a clamping device (19) with threaded connecting means (20, 28) for a cutting-off tool (3), said arm having brackets (11–27) designed to permit their mounting to be made at least in two working positions opposed to each other relative to the motor body (1), while the driving motor is assumed to work in the same direction of rotation in both working positions, the threaded connecting means comprising one or more parts (20) fitted to the shaft means (18) and one or more relative thereto removable parts (28), CHARACTERIZED BY the parts (20) of the threaded connecting means provided on the shaft means (18) being designed with threads for right hand as well as left hand thread and by the remaining part of parts (28, 29) exhibiting elements with either right hand thread or left hand thread, arranged to be alternated in such a manner that the operative thread is a right hand thread of a left hand thread according to the direction of rotation exhibited by the cutting-off tool (3) in its different working positions, by means of which arrangement a tightening of the threaded connecting means is



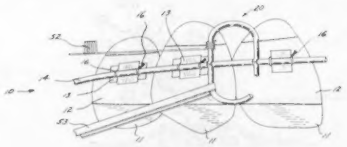
obtained in case of a possible slip of the cutting-off tool (3) relative to the shaft means (18) independently of the direction of rotation determined by the working position.

3,893,241

ORTHODONTIC HOOK DEVICE

Thomas M. Moriarty, 2507 S. 105th Ave., Omaha, Nebr. 68124

Filed Jan. 28, 1974, Ser. No. 436,904
Int. Cl. A61c *7/00*
U.S. Cl. 32—14 A **8 Claims**



1. An orthodontic hook device used as an attachment point for elastics, said hook device comprising:

an arch wire; and

a hook formed from wire and having a generally ovoid shape open at one end, said hook secured at two places proximate its midpoint to said arch wire, wherein that portion of said hook disposed above said arch wire forms a closed loop and that portion disposed below said arch wire forms an open loop.

3,893,242

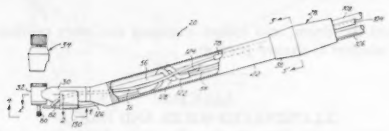
AIR DRIVEN DENTAL HANDPIECE

Nathaniel H. Lieb, Narberth; Franklin W. Kerfoot, Jr., Newtown Square; Richard A. Wallace, Audubon, and Kurt Sotman, Wynne, all of Pa., assignors to Star Dental Manufacturing Co., Inc., West Conshohocken, Pa.

Division of Ser. No. 217,745, Jan. 14, 1972. This application June 5, 1974, Ser. No. 476,748
Int. Cl. A61c *1/10*
U.S. Cl. 32—27 **1 Claim**

1. A dental handpiece comprising a hollow handle, a turbine housing mounted perpendicularly on one end of said handle, said turbine housing having an air turbine rotatably mounted therein, said air turbine comprising a rotor shaft and a plurality of radially extending blades mounted thereon, said rotor shaft extending perpendicularly to said handle, and means within said handle for delivering air to said blades for rotating

the same, said air delivering means comprising a pair of spaced tubes in said handle, said tubes having ends thereof coplanar and lying in a plane that is perpendicular to the axis of said rotor shaft, said ends terminating at said turbine housing and being in fluid communication with the interior of said turbine housing, said ends having outlet ports adjacent said blades, with each of said tubes adapted to supply air which impinges directly and radially against said blades, a fiber optic lighting system within said handle, said fiber optic lighting system comprising a plurality of light transmitting fibers having an opaque sheathing thereover, said light system having a terminus adjacent said turbine housing, said terminus projecting from said handle and being adapted to direct light passing through said fiber optic system to the area around a dental bur which is secured in said housing, said rotor shaft being rotatably mounted in said housing, said rotor shaft having a hollow bore, a collet threadedly secured within said rotor shaft, said



collet having a plurality of jaws which are compressible by said rotor shaft when said collet is threadedly advanced within said rotor shaft, and said jaws expanding when said collet is retracted in said rotor shaft, said rotor shaft having at least one axial slot formed in the top thereof, and a wrench for advancing and retracting said collet in said rotor shaft, said wrench comprising a housing, said wrench housing being placed over said turbine housing of said dental handpiece, a tube mounted in said wrench housing, said tube being secured to said wrench housing, said wrench housing having a cavity formed therein, means within said cavity securing said wrench housing on said turbine housing, said securing means comprising a spring, said spring being positioned within a groove formed in the wall of said cavity, said tube having a finger which is received in said slot of said rotor shaft, and a shaft rotatably mounted within said tube, said tube shaft being adapted to threadedly advance or retract said collet relative to said rotor shaft.

3,893,243

LETTERING TEMPLATE

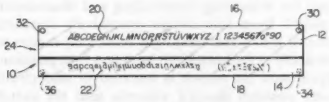
Rolf Schüller, Henstedt-Ulzburg, Germany, assignor to Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.

Filed Apr. 17, 1972, Ser. No. 244,436

Claims priority, application Germany, May 14, 1971, 7118804

Int. Cl.[2] G01B 3/14

U.S. Cl. 33—174 G **1 Claim**



1. A lettering template comprising:

A. a transparent overlay sheet having first and second longitudinally extending edges; and,

B. two groups of symbol cutouts respectively positioned in straight lines parallel to and inwardly placed from each of said longitudinal edges, and at equal distances therefrom, with the symbols in each group on opposite sides of said sheet and having their bases positioned towards a medial area of said sheet having a gradually increased material thickness extending above opposite surfaces of said overlay sheet, said thickened material area intermediate the groups of symbol cutouts thereby providing raised supporting surfaces at both a top and a bottom side of said overlay sheet, said support surfaces on each side defined in top and bottom support planes which are equally above and below the plane of said overlay sheet; and,

C. a first set of projections extending from said plane of said overlay sheet, near each end of said first longitudinal edge, said first projections terminating at said top support plane; and,

D. a second set of projections extending from said plane of said overlay sheet, near each end of said second longitudinal edge, said second projections terminating at said bottom support plane.

3,893,244

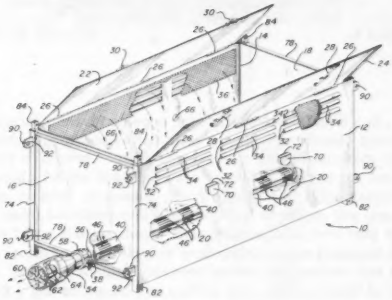
GRAIN STORAGE AND SHIPPING CONTAINERS AND METHOD OF USING THE SAME

Jack De Wayne Danford, Denver, Colo., assignor to Jack D. Danford and H. H. Champlin, both of Denver, Colo.

Filed July 15, 1974, Ser. No. 488,264

Int. Cl. F26b 7/00

U.S. Cl. 34—19 **16 Claims**



1. A grain storage and shipping container which is stackable with similar containers for transporting grain from one location to another, said shipping container comprising:

a receptacle for receiving and retaining a cargo of grain in loose bulk form;

the receptacle being in the general form of a rectangular box having upright side walls and end walls, a horizontal bottom wall, and closure means to overlie the open upper end of the receptacle in parallel relation to said bottom wall when closed so that another container can be stacked on top of said container;

first airflow port means extending along the major portion of the length of at least one side wall in the vicinity of its upper margin and opening through the side wall to the exterior atmosphere;

second airflow port means extending through a lower portion of an end wall below the level of the major portion of the cargo to be carried and opening to the exterior atmosphere, said second port means being connectable on the exterior of said container to power operated means;

duct means mounted adjacent to the bottom wall and extending generally parallel to the side wall containing the first port means and flow-connected to the second port means;

the duct means being perforated at various points along its length to permit the flow of air between its interior and exterior;

so that the power operated means can generate a continuous stream of atmospheric air flowing in through one of said port means and out through the other to withdraw

excess moisture from the grain and transfer it to the exterior atmosphere;

the relative arrangement and spacing between the first and second port means serving to define a general flow path between them encompassing substantially all of the grain in the cargo.

3,893,245

PHOTOCOPYING APPARATUS

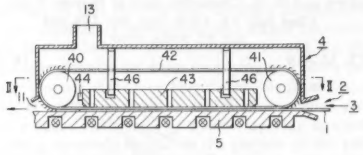
Wilhelm Knechtel, Rodheim-Bieber; Gerhard Petersdorf, Pohlheim, and Winfried Sandner, Rechtenbach, all of Germany, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 12, 1973, Ser. No. 340,558

Claims priority, application Germany, Mar. 28, 1972, 2215099

Int. Cl. F26b *11/02*

U.S. Cl. 34—95 **4 Claims**



1. In a liquid development type copying machine including a sealed chamber having a plurality of walls through which a copy material having a developed image thereon is transported for drying said copy material, said sealed chamber including inlet and outlet ports, stationary heating plate means, and means to transport said copy material from said inlet port over said heating plate means to said outlet port, said transport means comprising at least a pair of driven rollers and endless belt means movably extended around said pair of driven rollers, said endless belt means having a fluffy outer surface, the improvement comprising said heating plate means forming one of said walls of said sealed chamber, and said endless belt means sealing the inlet and outlet ports of said sealed chamber, by contacting a portion of said walls, and further comprising means to press said endless belt means against a stationary surface of said stationary heating plate means, wherein said copy material transported through said sealed chamber is uniformly interposed between and in uniform contact with each of said fluffy surface and said stationary surface of said heating plate.

3,893,246

SIEVE DRUM APPARATUS FOR THE CONTINUOUS TREATMENT OF LENGTHS OF TEXTILE MATERIAL

Hans Fleissner, Egelsbach near Frankfurt am Main, Germany, assignor to Vepa AG, Switzerland

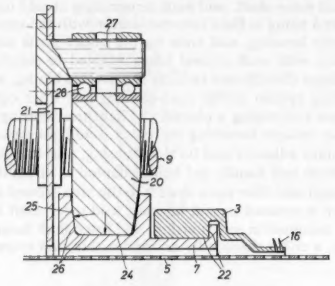
Filed Feb. 1, 1974, Ser. No. 438,536

Claims priority, application Germany, Feb. 1, 1973, 2304776

Int. Cl. F26b *13/00*

U.S. Cl. 34—115 **8 Claims**

1. In a sieve drum apparatus for the continuous treatment of lengths of textile material held along their width, on at least one sieve drum under a suction draft, around which is partially looped at least one tension chain guided in a ring, wherein the ring has a portion U-shaped in cross section in order to receive the tension chain and is mounted to be rotatable about the sieve drum by roller means attached to holding means guided on threaded spindles extending outside of the drum in the axial direction, the improvement wherein said ring has in addition to the U-shaped portion for receiving the chain, another U-shaped portion having an inner portion and said roller means comprise rollers disposed in spaced relationship



around the drum, said rollers engaging the inner portion of said another U-shaped portion.

3,893,247

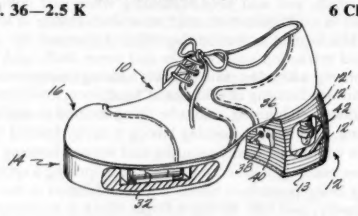
ILLUMINATED SOLES AND HEELS

Alfred Dana, III, 5700 Mariner Dr., Suite 504B, Tampa, Fla. 33609

Filed July 31, 1974, Ser. No. 493,610

Int. Cl.² A43B *00/00*

U.S. Cl. 36—2.5 K **6 Claims**



1. A shoe comprising:

a. a sole,

b. an upper,

c. a heel,

d. a source of e.m.f.,

e. a light bulb adapted to be operatively connected to said e.m.f. source,

f. a circuit operatively connecting said source of e.m.f. and said light bulb,

g. means for selectively connecting and disconnecting said e.m.f. source from said light bulb dependent upon the relative orientation of said shoe, said means including a tilt switch disposed within said circuit operatively connecting said source of e.m.f. and said light bulb, and

h. means for selectively connecting and disconnecting said tilt switch from said circuit operatively connecting said source of e.m.f. and said light bulb, said means including a manually actuated switch having a first position thereof wherein said tilt switch is inserted in said circuit and a second position thereof wherein said tilt switch is not inserted in said circuit and said source of e.m.f. and said light bulb are disconnected.

3,893,248

SNOW REMOVAL APPARATUS

Lee Young, 7425 College, Kansas City, Mo. 64132

Filed Aug. 26, 1974, Ser. No. 500,564

Int. Cl. E01h *5/06;* **E02f** *3/56*

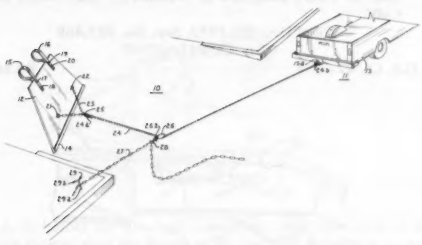
U.S. Cl. 37—41 **5 Claims**

1. Apparatus for use with a towing vehicle to remove snow from a surface, said apparatus comprising:

a scraper adapted to be towed in a longitudinal path along said surface by said vehicle to plow snow from said surface, said scraper including handle means adapted for manual grasping to enable same to be held and guided;

a horizontally disposed pulley freely elevated in proximity to one end of said surface, said pulley being located rearwardly of said vehicle and ahead of said scraper in alignment with the longitudinal path to be traversed by said scraper;

an elongate guy member having one end adapted to be anchored at a location offset to one side of said surface and a freely disposed portion coupled to said pulley in a manner permitting substantially free vertical movement of the latter; and



a flexible tow line of a greater length than the length of said surface and having opposite ends, one of said ends being coupled to said scraper and the other of said ends being adapted for coupling to said vehicle with the tow line being flexed around said pulley,

whereby said scraper may be towed by said vehicle along a longitudinal path in a direction toward said pulley and substantially perpendicular to the direction of travel of said vehicle with said guy member operatively retaining said pulley in alignment with said longitudinal path.

3,893,249

SUCTION DREDGER WITH SWELL COMPENSATION

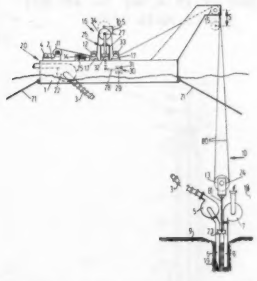
Tjako Aaldrik Wolters, 53, Kastanjelaan, Vianen, Netherlands

Filed Jan. 30, 1974, Ser. No. 437,761

Claims priority, application Netherlands, Feb. 2, 1973, 73.01503

Int. Cl. E02f *3/90*

U.S. Cl. 37—58 **12 Claims**



1. In a suction dredger system comprising a buoyant vessel, and a suction dredger mounted on said vessel and including an elongate suction conduit terminating in a suction nozzle, the combination of:

a cable suspension system for suspending said nozzle from said vessel while the suction nozzle is inserted in the bottom below the vessel, said cable suspension system including at least one winch on said vessel, a cable wound on said winch and issuing therefrom, a reversing pulley connected to said suction nozzle whereby such reversing pulley is subject to an environment which is inherently dirty during dredging operation, said cable being trained over said reversing pulley and secured to said vessel whereby to present at least two cable portions extending from said vessel to said reversing pulley, guide pulley means carried by said vessel and over which said cable portions are trained to suspend said suction nozzle, further guide pulley means on said vessel for guiding and maintaining said cable portions in side-by-side relation; and

swell compensation means, engaging said cable portions which are maintained in side-by-side relation by said further guide pulley means, for paying out and taking in said cable portions in unison as said vessel rises and falls due to wave action, whereby to move said cable relative to said guide pulley means only while obviating any significant movement of the cable over said reversing pulley.

3,893,250

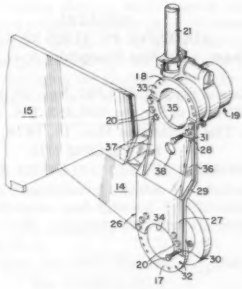
TRANSPORT BRACKET FOR TRACTOR SCRAPERS AND METHOD FOR USING THE SAME

Thomas R. Hamilton, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 31, 1974, Ser. No. 438,285

Int. Cl. E02f *3/62*

U.S. Cl. 37—129 **9 Claims**



1. A transported tractor scraper of the type having a scraper bowl connected to a tractor comprising

a laterally extending draft tube disposed longitudinally between said tractor and said scraper bowl;

a pair of draft arms each having a first end thereof detachably and pivotally mounted interiorly on a respective sidewall of said scraper bowl; and

a transport bracket detachably interconnected between a second end of each of said draft arms and said draft tube.

3,893,251

SPACED FRAME CONSTRUCTION

Kelly R. Coleman, 2367 Anna Ave., Clearwater, Fla. 33515

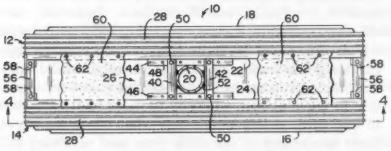
Continuation of Ser. No. 182,435, Sept. 21, 1971, abandoned. This application Aug. 16, 1973, Ser. No. 388,979

Int. Cl. G09f *13/04*

U.S. Cl. 40—130 R **8 Claims**

1. A display device comprising: a first and second frame, each connected to a support means and arranged thereon in spaced, substantially parallel relation to one another, each frame including an inner and outer portion; a display face mounted on said outer portion of each of said frames, whereby said display faces are viewable from opposite exterior portions relative to said device; cover means interconnected to both said frames and detachably mounted to said outer portions thereof, said cover means arranged to extend about at least a portion of the periphery of said device, whereby said cover

means at least partially encloses the space between said frames, thereby at least partially defining the interior of said device; and connecting means arranged on the interior of said device and adaptable to correspond to the configuration of said support means, said connecting means comprising atl least one tab member attached to said inner portion of each of said frames in corresponding position to one another, each of said tab members being located on different sides of said



support means, and attachment means disposed on said support means in interconnecting relation between said correspondingly positioned tab members, said connecting means further comprising adjusting means formed on each of said tab members and configured to engage said attachment means, whereby the location of said attachment means on said tab members may be varied depending upon the dimension of said support means and whereby said device is mountable on said support means of various sizes.

3,893,252

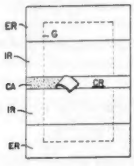
ADHESIVE PICTURE MOUNT

Marston Chase, 1330 New Hampshire Ave., Washington, D.C. 20036

Continuation of Ser. No. 877,583, Nov. 26, 1969, abandoned, which is a division of Ser. No. 690,858, Dec. 15, 1967, Pat. No. 3,517,106. This application Mar. 19, 1974, Ser. No. 452,554

Int. Cl. G09f *1/10*

U.S. Cl. 40—158 R **3 Claims**



1. An adhesive picture mount for mounting pictures or the like comprising a web of a size to accommodate a picture to be mounted with or without a surrounding mat, a layer of pressure sensitive adhesive is provided on both faces of the web for securing a picture to the mount, for securing a composite picture and mount to a support, and for securing the mount to a support, and a cover release sheet releasably retained on the adhesive, each cover release sheet comprising at least three separable sections each release sheet section extending completely across the mount and being removable as a unit to expose a section of the underlying adhesive, one of said release sheet sections being narrow and of a width so as to expose only a minor portion of the pressure sensitive adhesive in a narrow section completely across the web upon a removal of the one sheet section, the remaining sheet sections being so orientated relative to said one sheet section, and hence the adhesive section exposed by the removal thereof, as to retain an overlying picture supported thereon out of direct pressure contact with the exposed adhesive section until such time as the picture is manually depressed below the plane of the remaining sheet sections and into direct contact with the exposed adhesive section for securement thereto whereby the picture and mount can be moved relative to each other in overlying relation for accurate positioning until in final desired position, said exposed adhesive section being of a width so as to accommodate a manually depressed portion of the picture, said remaining sheet sections being removable subsequent to securement of the picture to the exposed adhesive section, the lines of separation of the adjacent separable sections on opposite sides of the mount being offset so as not to be directly opposite from each other.

3,893,253

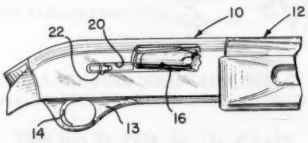
SHELL CATCHER FOR FIREARMS, PARTICULARLY SHOTGUNS

Roy E. Weatherby, Downey, and Fred L. Jennie, Buena Park, both of Calif., assignors to Weatherby, Inc., South Gate, Calif.

Filed Dec. 10, 1973, Ser. No. 423,468

Int. Cl. F41c *27/00*

U.S. Cl. 42—1 T **8 Claims**



1. The combination with a firearm, including a receiver and a barrel having mutually engagable parts, the receiver having a side opening defining an ejection port which normally permits ejection of a shell case therethrough, the improvement comprising: a shell catcher adapted to hold a spent shell case until manually removed from said opening, said shell catcher comprising a flat plate which is held by the receiver and barrell adjacent to one longitudinal edge of said ejection port and being positioned so that the plate restricts the width of the ejection port, thereby restricting a spent shell case from being fully ejected through the ejection port, said plate being shaped to restrict the ejection port in varying degree along its length so that a spent shell case can be moved forwardly to allow removal from said ejection port.

3,893,254

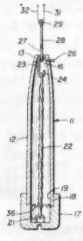
FISH HOOK SNELLING TOOL

Ronald L. Nack, 5015 W. Alaska Pl., Denver, Colo. 80219

Filed July 19, 1974, Ser. No. 489,851

Int. Cl. A01k *91/04*

U.S. Cl. 43—1 **11 Claims**



1. A fishing tool for in-hand usage when tying a fishing line to a fish hook comprising a body unit, a fish hook engaging spindle rotatably mounted at a first end of said body and adapted to receive and hold a fish hook as a fishing line is applied thereto, an anchor element disposed at an opposite end of said body, a resilient element operatively interconnect-

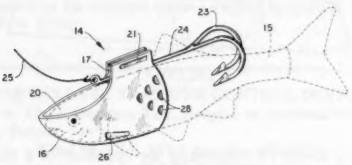
ing said spindle and anchor, means for prestoring torsional energy in said resilient element, and release means whereby the hook is rotated by the stored energy of said resilient means when the fishing line is to be tied to said hook.

3,893,255

HOLDER FOR LIVE BAIT

Thomas Weems Hicks, 3121 Maple Dr. S.E., Atlanta, Ga. 30305

Filed July 16, 1973, Ser. No. 379,806
Int. Cl. A01k *97/04*
U.S. Cl. 43—41 **12 Claims**



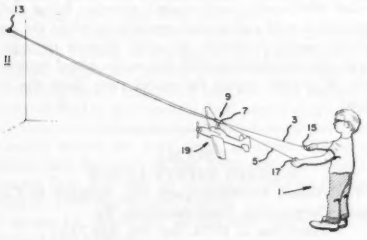
11. A holder for live bait comprising a flexible shell of a length shorter than the length of the live bait defining a cavity for enclosing the forward portion of the body of the live bait, a tail opening defined at the rear portion of said holder so that the tail portion of the bait in said holder normally extends from within said cavity through said tail opening, and a plurality of internally and forwardly extending scale elements struck from said flexible shell on opposite sides of said shell at said tail opening, said scale elements being sized and shaped to contact the live bait and inter-engage with the scales or the like of the live bait to retain the forward body portion of the live bait in the cavity of said shell.

3,893,256

TETHERED FLYING TOY

Tobin Wolf, 285 Aycrigg Ave., Passaic, N.J. 07055, and Ned M. Cain, West Patterson, N.J., assignors to by said Ned Cain said Tabin Wolf

Filed Dec. 3, 1973, Ser. No. 421,333
Int. Cl.[2] A63H *33/00, 27/04*
U.S. Cl. 46—1 R **12 Claims**



1. A flying toy movable along a pair of string portions by separation and convergence of said strings which comprises, in combination:

a. a toy member;

b. a hollow ring member secured to the toy through which both string portions extend, and

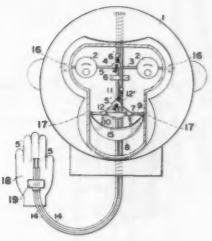
c. turning means secured within said toy member and responsive to a predetermined velocity of ascent of said toy member for rotating said toy member about an axis normal to the direction of travel of the toy member.

3,893,257

PUPPET HEAD WITH MOVABLE EYES AND LIP AND REMOTE HAND CONTROLS THEREFOR

Tokuhito Miki, Osaka, Japan, assignor to Perfect Liberty, Japan

Filed July 12, 1974, Ser. No. 488,252
Claims priority, application Japan, Jan. 10, 1972, 47-5484
Int. Cl. A63h *7/00*
U.S. Cl. 46—126 **1 Claim**



1. A puppet head or the like comprising a pair of simulated eyeballs, a simulated lip, first pivotal means within said head pivotally mounting said eyeballs therein, second pivotal means within said head pivotally mounting said lip therein, and flexible hollow wires having slidable wires therein connected to said first and second pivotal means, a glove of a size for receiving the hand of a user, means for securing said hollow wires to the palm of said glove and loops secured to the ends of said slidable wires for engaging the fingers of said glove, whereby said user may manipulate said slidable wires.

3,893,258

METHOD FOR GROWING CELERY TRANSPLANTS

Peter J. Compton, Santa Maria; Sheldon W. Moline, San Jose; Robert E. McKenzie, and Edward F. Christian, both of Salinas, all of Calif., assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 24, 1974, Ser. No. 463,530
Int. Cl. A01c *1/04*
U.S. Cl. 47—58 **10 Claims**

1. A method of growing celery transplants, comprising

coating celery seeds with a seed coating filling the recesses between ribs with the outer surface of the ribs remaining substantially uncoated to obtain a substantially smooth surface,

distributing said coated celery seeds at even intervals on a seed tape of water-soluble material,

planting finished said seed tapes in even spaced rows,

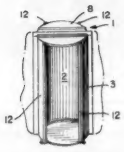
growing celery plants therefrom without any intermediate transplantation until they reach full size for transplantation in a final growing field, and

pulling the grown celery transplants which have long well-developed tap roots and hair roots.

3,893,259
REVOLVING DOORS

Edward Nineberg, Evanston, Ill., assignor to Consolidated International Corporation, Chicago, Ill.

Filed July 5, 1974, Ser. No. 486,120
Int. Cl. E06b *3/34*
U.S. Cl. 49—41 10 Claims

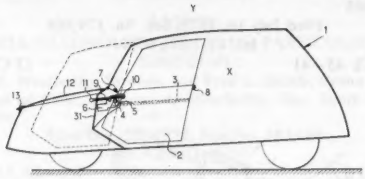


1. A revolving door comprising
a. an elongated, substantially cylindrical-shaped outer shell,
b. means for supporting said outer shell on a floor in substantially longitudinally upright position,
c. said outer shell comprising
1. a top wall,
2. an elongated side wall
a. extending longitudinally downward from said top wall, and
b. having two elongated openings in respective sides thereof and extending downwardly from the upper portion of said side wall through the lower edge of the latter, and
3. an annular ring mounted on the lower edge portion of said side wall and projecting radially inwardly thereof,
d. said opening being substantially unobstructed except for said ring,
e. an elongated, substantially cylindrical-shaped inner shell disposed in said outer shell,
f. said inner shell comprising
1. a top wall,
2. an elongated side wall
a. extending longitudinally downwardly from said last mentioned top wall, and
b. having an elongated opening in one side thereof extending downwardly from the upper portion of said last mentioned side wall through the lower edge thereof,
g. said shells being substantially round in transverse cross-section,
h. means operatively connecting said top walls together for rotatably supporting said inner shell for rotation around the longitudinal axis thereof within said outer shell and thereby moving said last mentioned opening into and out of registration with respective ones of said first mentioned openings,
i. said ring having annular track means concentrically disposed around said longitudinal axis of said outer shell, inwardly of said inner shell, and
j. follower means mounted on said inner shell and operatively engaged with said track means for holding the lower end portion of said inner shell against lateral movement during rotation of said inner shell around said axis of said outer shell.

3,893,260
CONTROL DEVICE FOR VEHICLE DOORS AND OTHER MEMBERS

Jean G. Cadiou, Paris, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Filed Apr. 30, 1973, Ser. No. 355,749
Claims priority, application France, May 2, 1972, 72.16015
Int. Cl.[2] E05F *11/34*
U.S. Cl. 49—362 8 Claims



1. In a device for controlling the operation of a movable member separating two spaces and disposed in part in a third space, said device comprising
an electric motor,
a first switch for selective activation of the electric motor from one of the two spaces, and
a second switch for selective activation of the electric motor from the other of said two spaces,
an actuating mechanism for the movable member,
a non-reversible transmission coupling the electric motor and the actuating mechanism, said transmission including a worm, and
a worm wheel rotatably mounted and coupled to the actuating mechanism and being so positioned that it is capable of engagement with the worm,
the improvement comprising:
means for disengaging the worm from the worm wheel, said means including
a casing carrying the electric motor and the worm which is rotatably mounted in said casing and driven by said motor and said worm wheel also being located within the confines of said casing,
said casing being so weighted and pivotally mounted that the worm is constantly urged away from the position of engagement with the worm wheel by the force of gravity, and
a control member accessible both in the said one space and in said third space, said control member being slidably disposed in said casing and operable to pivot the casing and the worm rotatably mounted therein to urge the worm into engagement with the worm wheel against the force of gravity urging the worm away from the worm wheel.

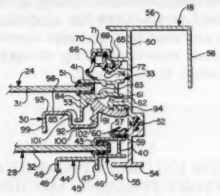
3,893,261
WINDOW SAFETY LATCH

James T. Cribben, Mechanicsburg, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.

Filed Jan. 2, 1974, Ser. No. 429,732
Int. Cl. E05d *13/04*
U.S. Cl. 49—449 10 Claims

1. A unitary extruded aluminum shape safety latch for sliding windows comprising a rounded hinge member; a latching member extending outwardly therefrom; a U-shaped web extending downwardly therefrom; a pull handle extending outwardly from said web and away from said latching member, and a catch on the end of said latching member; and U-shaped web comprising a base member, a leg extending from one end thereof joining said latching member and said rounded hinge member, and another leg extending from the other end of said base member and joining said pull handle;

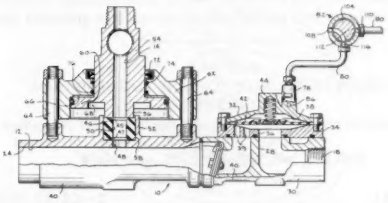
and, said leg of said U-shaped member, which joins said latching member and said rounded hinge member, having a channel formed on the internal surface thereof adapted to receive a flat bow spring.



3,893,262
PARTICULATE TRANSFER CONTROL DEVICE

James A. Giese, Houston, Tex., assignor to Fruehauf Corporation, Detroit, Mich.

Filed May 15, 1974, Ser. No. 470,227
Int. Cl.² B24C *7/00*
U.S. Cl. 51—12 **7 Claims**



1. A control means for use with apparatus for pneumatic transfer of a particulate material of the type including an air directing portion having an air flow-way therethrough, means supplying said air flow-way with compressed air, and a particulate directing portion having a particulate flow-way therethrough communicating with said air flow-way to deposit said particulate material in said air flow-way, said control means comprising:

air flow-way closure means operative to open and close said air flow-way;

particulate flow-way closure means operative to open and close said particulate flow-way; and

a sequencing mechanism operatively connected to said air flow-way closure means and to said particulate flow-way closure means and having control fluid passageways and including means responsive to a first flow pattern of said control fluid in said control fluid passageways, when said air flow-way closure means and said particulate flow-way closure means are both open, to cause closing of said particulate flow-way by said particulate flow-way closure means first, followed by closing of said air flow-way by said air flow-way closure means;

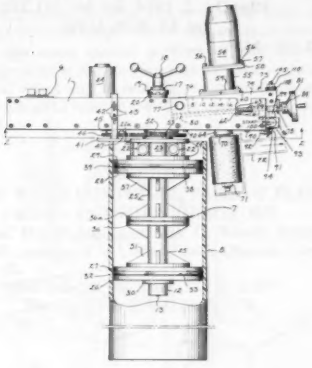
and means for selectively causing said control fluid to flow in said first pattern.

3,893,263
TAPERING TOOL

Robert M. Jackman, and William N. McDonald, both of Little Rock, Ark., assignors to A. O. Smith-Inland, Inc., Milwaukee, Wis.

Filed Sept. 9, 1974, Ser. No. 504,342
Int. Cl. B24b *9/00, 41/10*
U.S. Cl. 51—105 R **9 Claims**

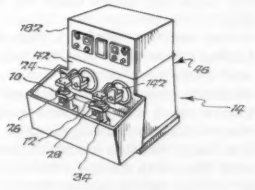
9. In a machine having a housing supporting a mandrel to receive and rotate a tubular workpiece for tapering the end thereof to a feathered edge by a grinding drum, a carriage pivoted at one end inside the housing and free at the outer end to be tilted in an arcuate path toward said workpiece, a ratchet and eccentric cam connected to the outer end of the carriage, a pawl connected to said housing in engagement with said ratchet and adapted to be reciprocated when the workpiece is rotated to rotate the ratchet and cam and thereby tilt the carriage toward the workpiece, a motor secured to the carriage and connected to the grinding drum to rotate the latter, a manually operated member secured to a shaft disposed in driving engagement with said cam to thereby manually actuate the cam and effect initial tilt of the carriage and to move the carriage back to start position when the grinding operation is completed, and means in the carriage to move the grinding drum longitudinally therein and therefore toward or away from the workpiece to taper workpieces of different diameter and govern the thickness of the taper.



3,893,264
LENS SURFACING APPARATUS AND METHOD

Adolph Behnke, Tampa, Fla., assignor to Textron Inc., Tampa, Fla.

Filed Nov. 23, 1973, Ser. No. 418,763
Int. Cl. B24b *13/02, 1/00*
U.S. Cl. 51—119 **26 Claims**



25. A lens grinding machine for forming a compound curvature on a lens surface comprising

a lap having a compound curvature on the surface thereof,

means for moving said lap in a first orbit,

a lens carrying block,

means for moving said block, simultaneously with the orbital movement of said lap, in a second orbit,

wherein one of said lap and said block moves in an orbit which in a reference plane describes substantially a circle and the other of said lap and said block moves in an orbit which in said reference plane describes substantially an ellipse, and

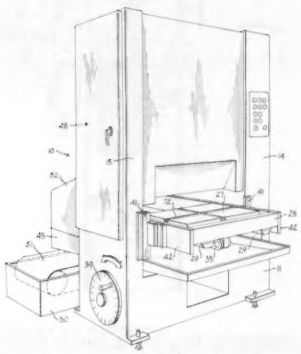
means for maintaining said lens surface in close contact with said lap surface and in a predetermined aligned relationship with respect to said lap surface during the simultaneous orbiting of said lap and said block.

3,893,265

VERTICAL ABRASIVE BELT TYPE SURFACE GRINDER

Donald C. Elm, St. Paul, and Allan J. Stinn, Minnetonka, both of Minn., assignors to Timesavers, Inc., Minneapolis, Minn.

Filed Oct. 2, 1974, Ser. No. 511,352
Int. Cl. B24b *21/00*
U.S. Cl. 51—143 **9 Claims**



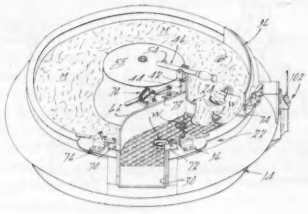
1. A metal grinding machine having a work loading station, the machine being of the type wherein the grinding is done by
a. an abrading head having an endless abrasive belt mounted to travel in a vertically oriented non-circular orbit, the parallel axes of which are substantially horizontal,
b. power drive means to impart orbital travel to the abrasive belt, and
c. a backup member extending transversely across and inside the orbit of the belt at the bottom of the orbit to form the bottommost part of the belt into a work performing band that extends straight across the width of the belt,
and wherein during the grinding operation the workpiece is supported with its surface to be ground substantially horizontal, facing upward and engaging said work performing band of the abrasive belt, said machine being characterized by:
A. work supporting means below the abrading head comprising
1. a bed member defining a path that leads from the loading station of the machine and is transverse to said work performing band,
2. a table to support a workpiece and present the surface thereof which is to be ground to the abrasive belt,
3. means slidably mounting the table on the bed member in a manner which transmits all downward loads on the table directly to the bed member,
said members (i.e. the backup member and the bed member) being adjustably movable vertically relative to one another to enable the machine to accommodate differently dimensioned workpieces;
B. means to effect said adjustment and thereby establish the elevation of the table at a level at which the surface of the workpiece to be ground is at a level above that of said work performing band of the abrasive belt;
C. feed means arranged to react between the bed member and the table to advance and retract the table along said path and thereby feed the workpiece against the work performing band of the abrasive belt with a force that has a component reacting vertically between said backup member and the bed member as the travel of the table presents unground portions of the workpiece surface to the abrasive belt; and
D. control means operatively connected with said feed means to resist the same and thereby govern the rate at which said feed means feeds the workpiece against the abrasive belt and maintain said rate constant during the grinding action, notwithstanding discontinuity in the workpiece surface being ground.

3,893,266

APPARATUS FOR UNLOADING WORKSTOCK FROM VIBRATORY FINISHING MACHINES

Gordon H. Anderson, and Richard T. Atherton, both of Albert Lea, Minn., assignors to King-Seeley Thermos Co., Ann Arbor, Mich.

Continuation of Ser. No. 210,026, Dec. 20, 1971, abandoned. This application Mar. 4, 1974, Ser. No. 447,966
Int. Cl. B24b *31/06*
U.S. Cl. 51—163 **39 Claims**

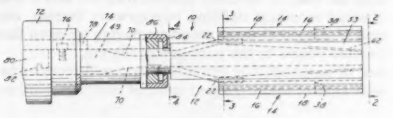


1. A vibratory finishing machine comprising,
a container including inner and outer side walls defining a generally circular finishing compartment therebetween adapted to receive finishing media and workpieces to be finished,
means defining an unloading area for said container and closure means normally closing said area but being movable during an unloading cycle to permit workpieces to be removed from said compartment,
means for imparting vibratory movement to said container, whereby said finishing media and workpieces move around said compartment,
unloading means for removing said workpieces from said container,
said unloading means including weir means extending transversely of said compartment between said inner and outer walls and adapted to cause said media and said workpieces to be moved from a first level toward an elevated level as the same passes over said weir,
said weir being pivotably mounted within said chamber and movable therein about a generally vertically extending axis located adjacent one of said side walls between a first position disposed generally tangent to said one side wall and a second position extending generally transversely of said compartment, and
separating means adapted to receive said media and said workpieces passing over said weir and thereafter convey said workpieces toward said unloading area and permit said media to drop downwardly therethrough into said compartment.

3,893,267
HONING TOOL

Clyde A. Swinehart, Unicio, and Lyle Stanford Hasty, Erwin, both of Tenn., assignors to MWA Company, Owosso, Mich.

Filed June 4, 1973, Ser. No. 366,986
Int. Cl. B24b 9/02
U.S. Cl. 51—338 3 Claims

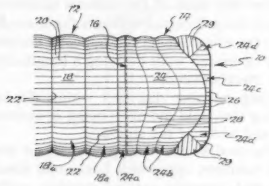


2. An abrasive unit adapted to be mounted on a honing tool mandrel, comprising an elongated carrier having a pair of elongated laterally spaced recesses in the outer face of said carrier extending lengthwise thereof, an elongated abrasive stick in each recess, means for releasably holding said abrasive sticks in said recesses comprising a wedge plate removably secured to said carrier between said recesses in wedging contact with said sticks, an elongated key, and means releasably securing said key to the front end of said carrier crosswise thereof and with the opposite ends of said key projecting beyond opposite sides of said carrier to provide retaining lips for retaining said carrier on the honing tool mandrel.

3,893,268
SQUARED END SECTION FOR AIR SUPPORTED STRUCTURE

Walter W. Bird, Williamsville, N.Y., assignor to Birdair Structures, Inc., Buffalo, N.Y.

Filed Aug. 27, 1973, Ser. No. 392,093
Int. Cl. E04b 1/345
U.S. Cl. 52—2 14 Claims



1. An air inflated structure adapted to overlie a ground anchorage, which comprises in combination:

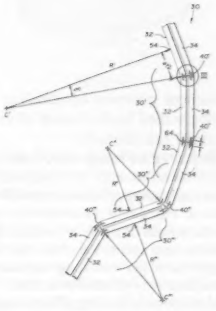
a central section having an air inflatable envelope portion of partial, generally cylindrically shaped surface configuration, said central section envelope portion arching upwardly over said ground anchorage and having lengthwise extending lower edges fixed in an air sealed relationship relative to said ground anchorage and hoopwise extending end edges; and

a pair of end means joined to said hoopwise extending end edges of said central section envelope portion for closing opposite ends of said central section at least one of said end means being an air inflated end section including an air inflated envelope portion of essentially square corner plan view configuration air sealed relative to said central section envelope portion and at least one flexible tension device, said end section envelope portion having an innermost, opposite side and outermost marginal edges, said innermost marginal edge arching upwardly over said ground anchorage and being fixed in an air sealed relationship to one of said end edges of said central section envelope portion, said opposite side and outermost marginal edges being fixed in an air sealed relationship relative to said ground anchorage, said tension device having opposite ends thereof fixed to said ground anchorage adjacent said opposite side marginal edges, said tension device extending transversely of said end section envelope portion and arching upwardly over said ground anchorage between said opposite ends thereof, said tension device being fixed to said end section envelope portion, said end section envelope portion maintaining said tension device in a tensioned condition and constraining same in a reverse curved configuration relative to the surface thereof for causing said tension device to pick up inflation pressure induced end section envelope portion loadings directed lengthwise of said structure from relatively high stress central portions of said end section envelope portion disposed intermediate said opposite side marginal edges and to redistribute at least a portion of such loadings to relative low stress opposite side portions thereof.

3,893,269
CURBED WALLS COMPRISING PAIRS OF PLANAR PANELS AND STUDS THEREFORE

Nels Nelsson, Des Plaines, and Alan C. Wendt, Barrington, both of Ill., assignors to United States Gypsum Company, Chicago, Ill.

Filed Feb. 20, 1973, Ser. No. 334,187
Int. Cl. E04b 1/344, 2/32, 2/78
U.S. Cl. 52—65 25 Claims



1. A generally circular wall segment comprising planar panels non-colinearly positioned to approximate a circle, each panel having a front surface and an edge surface, and a plurality of studs each positioned between two adjacent ones of said panels at their adjacent edges and interengaging the same, each of the studs being characterized by a center web portion, at least one flange extending from two opposite sides of the web portion at a non-orthogonal angle thereto, interengaged with the edge surface of one adjacent panel, and means positioned towards the convex surface of the wall from the flange for covering the gap between adjacent panels and for preventing convergence of the adjacent panels, said means including a flange extending so as to contact the edge surfaces only of two adjacent panels and having a width x defined by the following equation:

$$x = d + t(w \cos \alpha + d)/(R + a)$$

where w = the width of the panels, t = the thickness of the wall measured from the interior point of contact of two adjacent interengaged panels if translated into contiguous positions, to the point of contact with said covering means, R = the radius of curvature measured from the center of curvature of the wall segment to the midpoint of the interior surface of the wall segment, d = the distance, if any, the interior points of contact

of said panels are actually spaced apart in the wall as assembled, a = the depth of the chamfer, if any, of the panel surface defining said interior surface, and α = the angle between R and a line extending from the center of curvature through the midpoint of the separation between said adjacent edge surfaces.

3,893,270

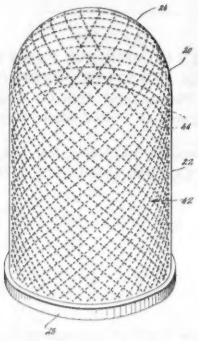
PRESSURE VESSEL

Morris Schupack, 37 Split Rock Rd., South Norwalk, Conn. 06854, and Andres van der Poll, 12 Fishing Trl., Stamford, Conn. 06903

Continuation-in-part of Ser. No. 271,322, July 12, 1972, abandoned. This application Oct. 25, 1973, Ser. No. 409,496

Int. Cl. E04b *7/08*; **E04c** *3/26*

U.S. Cl. 52—80 **16 Claims**



1. A containment structure comprising:

an upstanding walled body formed of concrete and having a longitudinal axis thereof;

said body including an integrally formed generally cylindrical-shaped member and an integrally formed generally hemispherically-shaped closure member;

a plurality of elongated prestressing tendons extending through the length of the body within the wall of the body between first and second anchor location which are positioned at a same general longitudinal location along the cylindrical member of said structure;

each of said tendons including a first integral segment which extends along a left-hand helical path through said cylindrical body member, a second integral segment which extends along a right-hand helical path through said cylindrical body member, and an arcuate integral segment extending between said first and second members, said tendon segments extending in helical paths which form an angle with the horizontal of between 35° and 55°.

3,893,271

BASIC BEAM STRUCTURAL MEMBER AND STRUCTURES BUILT THEREFROM

Joseph C. Kotlarz, 109 W. Woodlawn Dr., Village of Mundelein, Ill. 60060

Filed Sept. 27, 1973, Ser. No. 401,426

Int. Cl.² E04B *1/92*, *1/24*

U.S. Cl. 52—168 **9 Claims**

1. A building structure assembled from a plurality of the same basic beam structural members, said structure comprising:

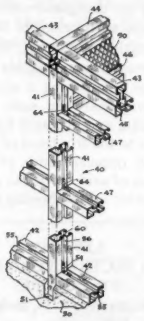
parallel, spaced, generally horizontally and vertically disposed basic beam structural members arranged in transverse relation to each other;

said horizontal members being engaged with said vertical members at preselected vertical heights thereon to form a framework structure with the vertical members; and

fastening means for said horizontal members to said vertical members in a secure abutting relation;

each of said horizontal members and said vertical members comprising an integral, elongated rigid structure having a pair of parallel, spaced, opposed U-shaped channel members, each said channel member having an end face and two side walls, and said side walls of each said channel extending towards and in a spaced, parallel relationship with the walls of the other channel member said U-shaped channel members defining passageways therein, one of said U-shaped channel members having an open face to provide access to the passageway therein;

a pair of longitudinally extending, opposed recesses in the side walls of said U-shaped channel members, said recesses being formed by walls projecting inwardly from the respective side walls of the channel members, and a pair of spaced walls disposed between the inwardly projecting walls to thereby connect the opposed channel members, the pair of spaced walls defining a longitudinally extending slot therebetween;



a reinforcing member disposed within the longitudinally extending slot, said member being coextensive with the length and width of the slot; and

a cable disposed in the passageways of an interconnected vertical member, uppermost horizontal member forming a truss, and opposing vertical member, said cable being anchored to the foundation at each end thereof at the bottom of each of the opposing vertical members to thereby provide extra rigidity to the assembled structure.

3,893,272

SEALING JOINTS FOR CURTAIN WALLS

Paul Plom, Pougues-les-Eaux, France, assignor to Hutchinson-Mapa, Grenoble, France

Filed Aug. 29, 1974, Ser. No. 501,526

Claims priority, application France, Sept. 19, 1973, 73.33568

Int. Cl.² E04B *2/88*, *1/66*

U.S. Cl. 52—235 **7 Claims**

1. In a curtain wall comprising a plurality of juxtaposed panel means,

a plurality of vertical profiled joints,

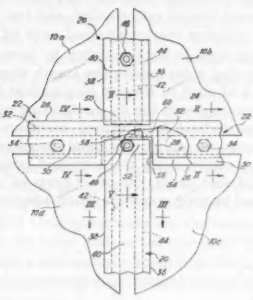
a plurality of horizontal profiled joints, and

fixing means maintaining said joints in compression on the exterior edges of said panels, said joints being arranged to form a lattice,

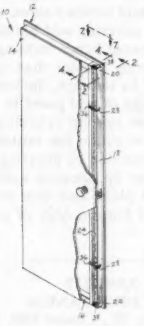
the improvement comprising;

external flap means provided to each of said horizontal joints with said flap means oriented downwardly, each of said horizontal joints interrupting at least one of said

vertical joints and each of said interrupted vertical joints having at least one interruption thereof whereat an upper portion of said interrupted vertical joint overlaps on to the upper edge of the respective horizontal joint means and a lower portion of said interrupted vertical joint means is disposed beneath the respective flap means of said respective horizontal joint means.

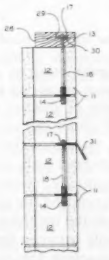


3,893,273
DOOR WITH IMPROVED CAMBER SETTING MEANS
Vernon R. Sailor, 1258 Rivershore La., Elkhart, Ind. 46514
Filed July 19, 1973, Ser. No. 380,706
Int. Cl.[2] E04C *23/00*
U.S. Cl. 52—291 **3 Claims**



1. In a door having front and rear spaced sheet panels applied over opposite sides of a frame and including upper and lower edges, said frame including a vertical member extending from adjacent said upper door edge to adjacent said lower door edge, said frame member including upper and lower end portions and having opening means formed therein extending the length of said member from said upper to said lower end portion, a horizontal slot formed in said frame member between and spaced from said upper and lower end portions, said slot intersecting said opening means and extending from said rear sheet panel and terminating spacedly rearwardly of said front sheet panel, the improvement comprising a rod member fitting shiftably within said opening means, one end of said rod member being threaded and located at said upper frame member end portion, the other end of said rod member being threaded and located at said lower frame member end portion, adjustment means having parts threaded onto each of the threaded ends of said rod member, one adjustment means abutting the upper end portion and the other adjustment means abutting the lower end portion of said frame member, anchor means of a length greater than the transverse dimension of said opening means connected to said rod member and fitting within said slot for anchoring said rod against rotational movement within said opening means relative to said frame member, said anchoring means having a thickness less than the width of said slot permitting limited vertical movement of said rod member relative to said frame member during rotation of either of said adjustment means upon said rod member against said abutting frame member end portion to cause said frame member to be compressed between said adjustment means and bowed to provide a camber for said door with said front panel being of a convex configuration.

3,893,274
MASONRY FASTENER
Jeffery J. Salisbury, 328 Kensington Pl., Syracuse, N.Y. 13210
Filed Sept. 9, 1974, Ser. No. 504,312
Int. Cl. E04b *2/00*
U.S. Cl. 52—300 **6 Claims**

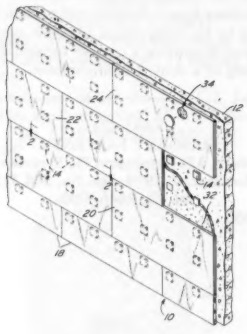


5. An anchor bolt device for masonry walls of building blocks having vertically extending apertures therethrough for securing to the wall longitudinally extending associated wall members, the device comprising: a nut, a bolt, and a rectangular plate of a thickness less than the thickness of the mortar layers of the wall; the bolt having a first end substantially circular in cross section and threaded for engagement therealong with the nut; the bolt other end being deformed to form flat surfaces on diametrically opposite sides and to extend the other opposite sides projecting beyond the circular surface of the first end, the thickness between the flat sides being less than the diameter of the first end and the projecting sides having arcuately curved surfaces; the bolt other end having a plurality of longitudinally-spaced circularly-extending grooves therearound, the inner diameter of the grooves being substantially equal to the thickness between the flat sides, the grooves having a width substantially equal to the plate thickness; the plate having a hole therethrough conforming to the cross-sectional shape of the bolt other end and being deformed adjacent the hole for forming a positive stop against which a projecting rounded side of the bolt other end abuts when the bolt is inserted in the plate hole with a selected one of the grooves aligned with the plate and the bolt is then turned 90°, the plate having also a dimple-like deformation adjacent its hole substantially tangent to the path of one of the rounded projecting sides of bolt other end when the bolt is turned toward the positive stop deformation; whereby the plate is embedded in a selected mortar layer when building the wall, the bolt is placed threaded end up extending through a block aperture with its other end through the plate hole with a selected groove aligned with the plate and then turned 90° thereby locking the bolt to the plate with its threaded end extending up above the block and adapted to pass through a hole through the associated wall member for securing the associated member to the wall by the nut.

3,893,275
REBOUND WALL AND METHOD

Ray E. Omholt, c/o Powerlock Systems, Inc., Mid-Atlantic Park, 590 Grove Rd., Thorofare, N.J. 08086

Filed Mar. 8, 1973, Ser. No. 339,496
Int. Cl. E04b 2/40
U.S. Cl. 52—309 8 Claims



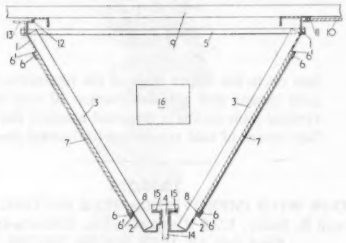
1. A method of constructing an upright rebound wall on a substantially continuous receiving surface including the steps of providing a plurality of abutting vertically disposed panels the outer surfaces of which can comprise the playing surface of the rebound wall, selecting relatively large panels to minimize seams in the rebound wall, securing a plurality of relatively thin and substantially incompressible spacer shims directly between the panels and the receiving surface so that the panels are spaced from the receiving surface by only the shims and so that a gap exists between the panels and the receiving surface, directly contacting the receiving surface with one face of the shims, directly contacting the rear face of the panels with the opposite face of the shims, providing securing means sufficient to hold the panels in fixed spaced relationship with respect to the receiving surface, attaching the shims directly to the receiving surface, selecting the thickness of the shims so that the outer surfaces of the shims lie in a substantially vertical plane directly against the rear face of the panels, locating the shims at spaced isolated locations on the receiving surface with the shims being discrete in all directions, introducing a pourable material which will become adhesive and cohesive into the gap between the panels and the receiving surface, causing the pourable material to completely flow into and fill the gap and to flow around the isolated and discrete spacer shims, permitting the pourable material to set and bond the panels to the receiving surface solidly to thereby provide a solid base support for the panels, whereby a quiet and solid rebound wall having uniformity of rebound is attained.

3,893,276
BEAM AND BUILDING INCORPORATING THE SAME

David James Brown, Winchester, England, assignor to Conder International Limited, Winchester, England

Continuation of Ser. No. 305,652, Nov. 13, 1972, abandoned.
This application May 6, 1974, Ser. No. 467,148
Int. Cl.[2] E04H 12/00; E04B 5/57
U.S. Cl. 52—483 9 Claims

1. In a building construction comprising a roof or floor, at least one primary structural member in the form of a beam extending beneath and supporting said roof or floor, said beam comprising four longitudinal load-bearing members arranged in an inverted generally triangular configuration as seen in cross-section with one of said longitudinal load-bearing members running the length of the beam along each of the two top edges of the triangular configuration and with the two remaining longitudinal load-bearing members running the length of the beam along the downwardly depending bottom edge thereof to delineate three longitudinal sides of said beam, two of which are inclined to both the vertical and the horizontal, said longitudinal load-bearing members each being formed from strip material provided with longitudinal bends therein, including a first such bend which divides said longitudinal load-bearing member longitudinally into two substantial parts angularly disposed toward one another, and two longitudinal reverse bends adjacent the longitudinal edge of one part of said longitudinal load-bearing member to form an integral off-set lip extending substantially the length thereof, said lip on the one part of each of the top longitudinal load-bearing members cooperating with the lip on said one part of one of the bottom longitudinal load-bearing members to provide outwardly off-set integral longitudinal panel-retaining lips extending substantially along the tops and bottoms of said inclined sides of said beam, the other parts of said two top longitudinal load-bearing members being adapted to support

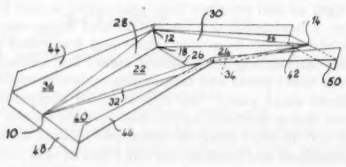


said floor or roof and the other parts of the two bottom longitudinal load-bearing members being secured to one another, said beam further comprising bracing members inter-connecting said cooperating top and bottom longitudinal load-bearing members and panels on said inclined sides, said panels being retained by said lips and covering said bracing members, the distance apart of said reverse bends forming the lips on any one said inclined side being greater than the height of the respective panel retained by said lips, the top said lip extending lower than the top edge of said panel to retain the top of said panel, and the bottom said lip extending above the bottom edge of said panel to retain the bottom of said panel, whereby said panels are inserted by inserting said top edge of said panel behind said top lip, locating said bottom edge of said panel in the correct plane and then moving said panel downwards to retain said bottom edge of said panel behind said bottom lip.

3,893,277
BUILDING PANELS

Albert Constant, 7 Braby Pl., Cowies Hill, Pinetown, South Africa

Filed Aug. 9, 1973, Ser. No. 387,047
Claims priority, application South Africa, Aug. 21, 1972, 72/5747
Int. Cl. E04c 2/32, 2/28
U.S. Cl. 52—630 2 Claims



1. A building panel having a rectangular configuration in plan view, said panel including an upper face comprising a main web including two planar isosceles triangular portions

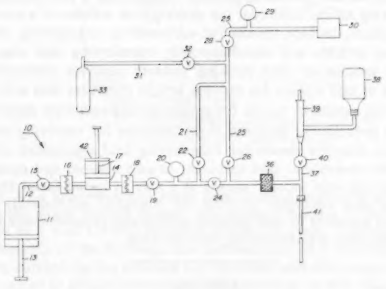
extending outwardly from a common inner side, the common inner side of said triangular portions joining said triangular portions to form a parallelogram, the planes of said triangular portions intersecting at an angle at the common side and sloping downwardly therefrom toward the opposed outer apices of the triangular portions, upwardly and outwardly inclined pairs of triangular walls adjoining the opposite sides of the outwardly extending isosceles triangular portions, the outer apices of the inclined triangular walls being contiguous with the opposed outer apices of the triangular portions of the main web, each pair of inclined triangular walls having a common inner side and lying in the same vertical plane as the common side of the triangular portions, and triangular apron portions adjoining the outer longitudinal side of each of the inclined triangular walls, the apices of said apron portions lying in said vertical plane, the outer end of each apron portion further lying in vertical planes containing the contiguous outer apices of the triangular walls and the triangular portions, whereby when the outer ends of the triangular apron portions are supported in a substantially horizontal plane, water falling on said building panel will drain toward at least one outer edge of said building panel.

3,893,278

METHOD OF MANUFACTURING CAPSULES CONTAINING GASEOUS RADIOISOTOPE

Robert E. Lewis, Pleasanton, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Aug. 15, 1973, Ser. No. 388,488
Int. Cl. B65b *29/00*
U.S. Cl. 53—5 **16 Claims**



1. A method of manufacturing a capsule comprising a shearable gas impermeable enclosure having therein a gaseous radioisotope comprising the steps of

a. introducing the gaseous radioisotope and a gaseous diluent into a mixing zone,

b. mixing the radioisotope and the diluent in the mixing zone,

c. discharging the mixture of step (b) into a gas impermeable enclosure sealed on one end,

d. sealing the gas impermeable enclosure into segments of a selected size, and

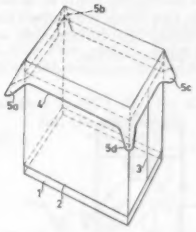
e. separating the segments into individual capsules.

3,893,279

METHOD OF PACKAGING LOAD UNITS IN WELDABLE PLASTIC FOIL

Sigward Gunnar Bostrom, Jonkoping, Sweden, assignor to ARENCO-JM AB, Jonkoping, Sweden

Filed Jan. 4, 1973, Ser. No. 320,841
Claims priority, application Sweden, Jan. 5, 1972, 132/72
Int. Cl. B65b *11/58, 41/18*
U.S. Cl. 53—27 **1 Claim**



1. Method of packaging load units in weldable plastic foil, comprising the steps of initially wrapping a first, tensible, plastic stretch foil web in a closed path around substantially the whole circumferential area of the load unit by unreeling two individual portions of said first stretch foil web substantially symmetrically from a respective one of two foil supply rolls having substantially parallel vertical rotational axes and having their free foil ends united with each other along a substantially vertical junction line, and advancing said load unit between said rotational axes; uniting said two unreeled web portions of said first foil web with each other along a substantially vertical junction line by welding together said unreeled portions of said first foiled web on the rear side of the load unit, as seen in the direction of advancement of said load unit, said first foil webbing substantially stretched in connection with the wrapping operation and having its upper longitudinal edge located below the top end surface of said load unit; covering the top end surface of said load unit with a second tensible plastic stretch foil, which is made to overlap and cover said upper longitudinal edge of said first stretch foil web, which extends around the load unit; subsequently wrapping a third, tensible and weldable plastic stretch foil web, which is made to cover the major part of first stretch foil web and those portions of the second foil, which overlap said upper edge of said first stretch foil web, in a closed path around substantially the whole circumferential area of said load unit in the same way as said first stretch foil web, said third stretch foil web also being substantially stretched in connection with the wrapping operation, substantially double, dependent flaps formed with said second foil at each vertical edge of the load unit, being pairwise folded in mutually opposite directions during the wrapping of said load unit in said third stretch foil web; uniting the two unreeled web portions of said third foil web with each other along a second, substantially vertical junction line in the same way as the two unreeled portions of said first stretch foil web; and finally joining said second stretch foil spot-wise to said third stretch foil web.

3,893,280

TRANSFER PACKAGING FOR BIOLOGICALS

Dale A. King, Overland Park, Kans., assignor to Burns-Biotec Laboratories, Inc., Oakland, Calif.

Filed June 21, 1972, Ser. No. 264,890
Int. Cl. B65b *5/00*
U.S. Cl. 53—37 **3 Claims**

1. A method of separately sub-packaging freeze-dried virus cake and the diluent therefor in a common package for later reconstitution of the virus cake and diluent by mixing same together comprising the steps of:

packaging the freeze-dried virus cake within a first relatively smaller bottle,

the quantity of virus cake in the first bottle such and the first bottle sized substantially no larger than that a single filling of the first bottle with diluent will dissolve the entire virus cake therein for transfer thereof to said second bottle,

packaging the diluent in a second relatively larger size bottle, said diluent operative to reconstitute the virus cake for use when mixed therewith,

the largest quantity of diluent receivable in the second bottle such and the second bottle so sized, that, when the virus cake in the first bottle is dissolved therein, the resultant solution meets the Government requirement for minimum viral quantity in use,

said first and second bottles packaged together in a third disposable container for ultimate use and application by a further step wherein, after removal of said first and second bottles from the said third containers,

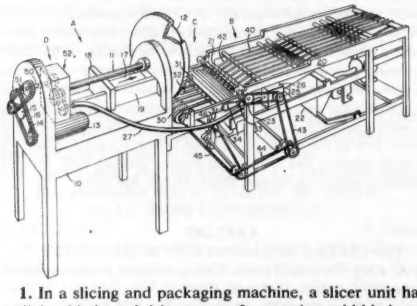
a single quantity of diluent is transferred in a single batch from the said second larger bottle to said first smaller bottle thereby to dissolve all of the freeze-dried virus cake therein and thereafter the said completely dissolved viral fluids, in diluent, are transferred back to said second relatively larger bottle in a single batch to provide in said second bottle a properly proportioned and concentrated virus solution.

3,893,281

MACHINE FOR PACKAGING MATERIALS

James P. Smithers, Glen Ellyn, Ill., assignor to Armour and Company, Phoenix, Ariz.

Filed Sept. 27, 1973, Ser. No. 401,345
Int. Cl. B65b *65/02*
U.S. Cl. 53—123 **7 Claims**



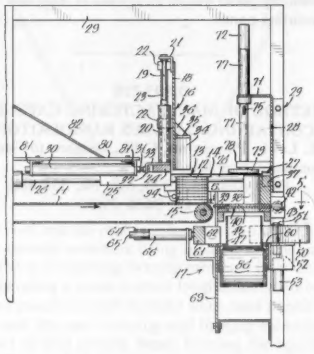
1. In a slicing and packaging machine, a slicer unit having a slicing blade and drive means for rotating said blade as the material to be sliced is passed through said unit to thereby produce slices of said material, a packaging unit which includes a stepped roll and means for delivering packaging film over said roll, conveyor means for receiving slices produced by said slicer unit and for delivering said slices consecutively to said roll, drive means for rotating said roll, a first gear in drive relation with said blade rotating means, a second gear in drive relation with said roll rotating means, and a third gear in engagement at one point on its periphery with said first gear and at another point on its periphery with said second gear, and means for moving one of said first and second gears about the axis of said third gear to change the angular distance therebetween while each is engaged with said third gear.

3,893,282

ARTICLE PACKER APPARATUS

Melvin L. Armbruster, 1299 S.W. 14th St., Boca Raton, Fla. 33432; Anthony O. Campanale, 3607 N.W. 84th Terr., Coral Springs, Fla. 33605, and Robert L. Schultz, 1020 S.W. 18th St., Boca Raton, Fla. 33432, assignors to Hollymatic Corporation, Park Forest, Ill.

Filed July 26, 1974, Ser. No. 492,012
Int. Cl. B65b *35/44*
U.S. Cl. 53—252 **11 Claims**



1. An article packer apparatus, comprising: a continuously operating article conveyor for moving said articles to a packing station; locator means for successively segregating said moving articles and simultaneously transferring said segregated articles to said packing station; receiver conveying means at said station for moving article receivers into article receiving position; means for retaining said receivers stationary in preselected patterns at said station for receiving said articles; transfer means for transferring said segregated articles successively to said receivers at said station; and means for moving said locator means at a rate of speed faster than that of said conveyor to clear the conveyor successively of articles adjacent to said packing station and provide space for the next said articles during said packing.

3,893,283

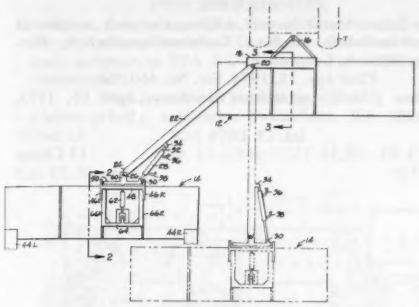
VARIABLE WIDTH EARTH SURFACE TREATING APPARATUS

John E. Dandl, 279 Rio Linda Ave., Apt. No. 2, Chico, Calif. 95926

Filed June 20, 1974, Ser. No. 481,379
Int. Cl. A01d *75/30*
U.S. Cl. 56—6 **7 Claims**

1. Earth surface treating apparatus comprising a first surface treating unit mountable on a vehicle, a second surface treating unit having means for supporting the second unit for movement over the earth surface, a rigid drawbar having a first extremity pivotally secured to said first unit and a second extremity pivotally secured to said second unit so that said second unit trails said first unit, said extremities pivoting on substantially vertical axes, an actuator having first and second ends and means for controllably moving said ends toward and away from one another, said first end being attached to said second unit at a point laterally spaced from the second ex-

tremity of said drawbar, said second end of said actuator being attached to said drawbar at a point spaced from said second



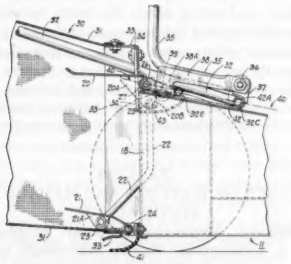
extremity, and means accessible from the vehicle for remotely controlling said actuator to vary the pivotal position of said drawbar relative said second unit.

3,893,284

LAWN MOWER AND COLLECTOR THEREFOR

Donald G. Thon, Middleburg Heights, and Juergen Kaesgen, Brunswick, both of Ohio, assignors to MTD Products Inc., Cleveland, Ohio

Filed Dec. 20, 1973, Ser. No. 426,502
Int. Cl. A01d *35/22*
U.S. Cl. 56—202 **15 Claims**



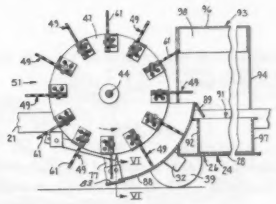
1. In a lawn mower having grass cutting means, a housing for the grass cutting means, the housing having a discharge port in a wall thereof through which cut grass is discharged outwardly of the housing, the combination of a movable closure carried by the housing for blocking said discharge opening when in closed position and for opening up said discharge port in opened position, said closure being subject to bias to urge the closure toward said closed position, a collector for collecting cut grass discharged through said discharge port, said collector being adapted to be mounted upon said housing adjacent said discharge port, a bracket carried by said housing adjacent said discharge port adapted to interengage with said collector upon positioning the collector adjacent said discharge port, operable linkage means carried by said housing for moving said closure to said opened position in opposition to said bias, and pivotal lever means carried by said collector and located to interengage with said linkage means upon interengagement of said bracket and said collector, said pivotal lever means and said linkage means including overthrow means for holding said lever means in a locked position upon swinging the lever means in a direction to interengage with said linkage means and sufficiently to operate said linkage means to move the said closure to said opened position, said lever means in said locked position retaining said collector interengaged with said bracket and in position for receiving cut grass discharged through said discharge port, the said lever means upon being swung in an opposite direction to an unlocked position disengaging said linkage means to permit said linkage means to operate so as to permit said closure under the urging of said bias to move to said closed position, said lever means upon being swung to said unlocked position permitting the said collector to be released from retention be said bracket.

3,893,285

ASPARAGUS SNAPPER

Ann M. Seeley, Paw Paw, and H. Eldon McKibben, Grand Junction, both of, MI, assignors to Ann M. Seeley, Paw Paw, Mich.

Filed Dec. 3, 1973, Ser. No. 421,449
Int. Cl. A01d *45/00*
U.S. Cl. 56—327 A **6 Claims**



1. A machine for harvesting asparagus stalks having a tender part located above the ground and adapted to be moved in a forward horizontal direction, comprising:

means defining a wheel supported frame;

support means mounted on said wheel supported frame means;

means defining a paddle wheel configuration rotatably mounted on said support means, said paddle wheel configuration means including a plurality of flexible paddle means extending generally radially outwardly from said support means and have outer edge portions spaced circumferentially around the periphery of said paddle wheel configuration;

means defining a stationary, generally horizontally extending plate means having a straight leading edge secured to said wheel supported frame means and extending beneath said paddle wheel configuration and being vertically spaced from the ground and from said edge portions of said paddle means, said leading edge being located forward of a vertical plane containing the axis of rotation of said paddle wheel configuration;

collecting means mounted on said frame means for collecting the severed asparagus stalks;

stationary slide means secured to said plate means and extending generally in an arcuate path between said plate means and said collecting means, the radius of said arc generally coinciding with the axis of rotation of said paddle wheel configuration so that said edge portions of said paddle means remain spaced from said stationary slide means but yet capable of effecting a transfer of the severed asparagus stalks to said collecting means; and

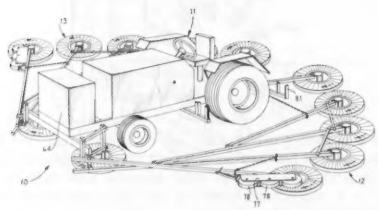
selectively variable speed drive means independent of the forward speed of said wheel supported frame means and transmission means operatively connecting said variable speed drive means with said paddle wheel configuration to effect a rotational movement thereof in a direction wherein the lowermost ones of said paddle means are moved at a selected horizontal velocity with respect to said wheel supported frame means, said paddle means engaging said asparagus stalks at the upper portion thereof, said leading edge of said plate means engaging

said asparagus stalks at said vertically spaced distance below said edge portions of said paddle means and said vertically spaced distance above the ground to effect a snapping off of said asparagus stalks at the location of said tender part above the ground whereby the speed of said variable speed drive means may be selected to correspond to the condition of the asparagus stalks at the time of harvest.

3,893,286
GATHERING AND WINDROWING MACHINE

James R. Buttram, Windermere; Melvin H. Woodward, Winter Garden; Charles E. Hubbard, Windermere, and Howard K. Thronson, Winter Garden, all of Fla., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed June 28, 1973, Ser. No. 374,646
Int. Cl. A01d *51/00*
U.S. Cl. 56—328 R **20 Claims**



1. An apparatus adapted for collecting fruit or the like lying on a supporting surface, such as the ground, comprising:

a carrier adapted to be moved along the ground, said carrier having means disposed in engagement with the ground for supporting the carrier on the ground and for enabling the carrier to be moved relative to the ground;

rotary brush means disposed adjacent the ground and supported thereon for rotation about an axis which is substantially upright, said brush means including a rotatable hub and a plurality of elongated bristles fixed to said hub and projecting radially outwardly therof, said bristles being constructed of a relatively stiff but flexible material, said bristles being disposed within a plurality of circumferentially extending layers which are spaced axially from one another along the rotational axis of said brush means; drive means drivingly connected to said brush means for rotating same about said axis;

means connected between said carrier and said brush means for permitting said brush means to be freely moved relative to said carrier in a substantially vertical direction;

support means connected to said brush means and positioned for engagement with the ground for supporting said brush means adjacent the ground, said support means being disposed within an imaginary cylinder defined by the periphery of said rotary brush means;

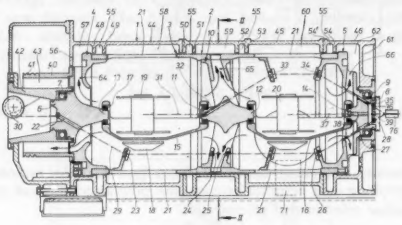
said support means comprising a support foot having a lower surface disposed for slidable engagement with the ground, said support foot being fixed to said brush means and rotatable therewith about said axis, whereby said lower surface likewise rotates as it slidably moves along the ground; and

deflector means mounted on said hub for causing at least the lowermost layer of bristles to be deflected slightly downwardly whereby the free ends of the bristles are disposed below said lower surface, said plurality of bristles extending generally parallel to the surface of the ground when the brush means is disposed in engagement therewith.

3,893,287
HIGH-SPEED STRANDING MACHINE WITH AIR COOLING

Walter Jahne, Marktoberdorf, Allgaeu, Germany, assignor to Maschinenfabrik Herborn Kommanditgesellschaft, Herborn/Dillkreis, Germany

Filed Apr. 15, 1974, Ser. No. 460,974
Claims priority, application Germany, Apr. 16, 1973, 2319145
Int. Cl. D07b *3/04*
U.S. Cl. 57—58.32 **13 Claims**



1. In a high-speed stranding machine for the manufacture of stranded wire from individual wires or from ropes of stranded wire, comprising a housing in which a windowed cylindrical rotor is supported rotatably and spaced from the inner wall of the housing, having at least one spool carrier which is pivotally suspended in the rotor and accessible through a window which is provided in the rotor, and devices for venting the inside of the housing, wherein on the inside of the housing there are arranged housing partition walls which extend to a point close to the rotor, and which divide the space between the inner wall of the housing and the outer wall of the rotor into window zones and into cooling zones, the improvement comprisng fan wheels fixedly connected to the rotor to convey air from the window zones into the cooling zones and between said window zones and said cooling zones and between the inside of the rotor and the atmosphere only small flow cross sections exist.

3,893,288
BALANCE OF WATCHES AND METHOD OF ITS MANUFACTURE

Heinz Meitinger, Mutlangen, Germany, assignor to Bifora-Uhren J. Bidlingmaier GmbH, Schwabisch Gmund, Germany

Filed Jan. 2, 1974, Ser. No. 429,583
Claims priority, application Germany, Jan. 20, 1973, 2302883
Int. Cl. G04c *3/04*; H03b *5/30*
U.S. Cl. 58—28 B **7 Claims**

1. A balance assembly for an electric watch comprising a shaft oscillatory about its axis, a hub member formed of an electrically insulating material rigidly connected to and symmetrical with said shaft, electromagnetic means mounted to said hub member and a metallic, electrically conducting ring member coaxial with said shaft and peripherally disposed about said hub member and in engaging retentive relationship therewith.

3,893,289
WATCH MOVEMENT WITH A CIRCULAR MOVABLE INDICATOR MEMBER

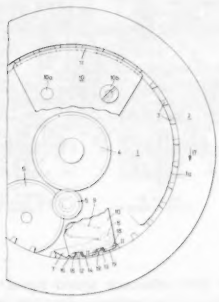
Urs Giger, Solothurn; Edwin Jakob, Grenchen; Friedrich Perrot, Lengnau, and Paul David, Biberist, all of Switzerland, assignors to ETA A.G. Ebauches Fabrik, Grenchen, Switzerland

Filed June 26, 1974, Ser. No. 483,435

Claims priority, application Switzerland, July 13, 1973, 10264/73

Int. Cl. G04b *19/24*

U.S. Cl. 58—58 **10 Claims**



1. A watch movement comprising a base plate having a protuberant portion, a circular movable indicator member provided with a peripheral toothing and rotatively guided by said protuberant portion of said base plate, a holding plate rigidly secured to said base plate and having an arcuate edge portion extending over an arc less than 180° above said toothing, a cover element extending opposite said edge portion and above said toothing, a stud fastened to said base plate, a support body adapted to pivot about said stud, said cover element being rigidly joined to said support body, and a spring which acts on said support body in such a way that a portion of said body presses against the toothing of the indicator member, whereby said portion of said body acts as a jumper.

3,893,290
AUTOMATIC WINDING MECHANISM FOR WATCH MOVEMENTS

Josef Fluck, and Roland Zaugg, both of Grenchen, Switzerland, assignors to A. Schild S.A., Grenchen, Switzerland

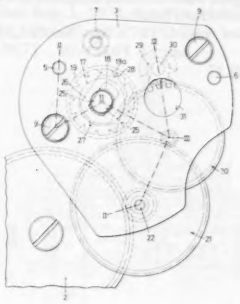
Filed Nov. 14, 1974, Ser. No. 523,749

Claims priority, application Switzerland, Nov. 21, 1973, 16357/73

Int. Cl. G04b *5/02*

U.S. Cl. 58—82 R **10 Claims**

1. An automatic winding mechanism for watch movements, comprising a support, an arbor pivotingly mounted on said support, a winding weight integral with said arbor, a winding gear-train, and a unidirectional clutch device coaxial with said arbor, the first gear of said gear-train being a reduction gear, and said clutch device connecting said arbor to said reduction gear so as to drive said gear-train when said weight rotates in a predetermined direction, wherein said support comprises two parallel elements guiding said arbor at two different levels, and said clutch device comprises, disposed between said elements, a wheel mounted loose on said arbor and having a cupped portion, an outer toothing, and an inner toothing, and a bolt which is situated in said cupped portion, is integral in rotation with said arbor, and is adapted for translatory motion perpendicular to the axis of said arbor, said bolt cooperating with said inner toothing to make said arbor and said wheel



integral upon rotation of said weight in said predetermined direction.

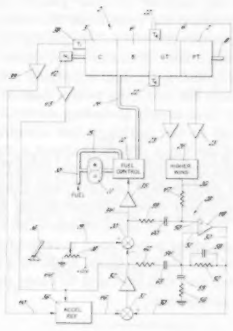
3,893,291
GAS TURBINE FUEL CONTROL

James L. Davis; Edward L. Lopke, both of Kokomo, and Leslie Joseph Pechous, Carmel, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 29, 1973, Ser. No. 392,739

Int. Cl. F02c *9/08*

U.S. Cl. 60—39.28 T **6 Claims**

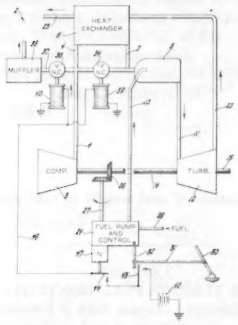


5. A system for controlling fuel flow to a gas turbine engine comprising, in combination, means responsive to a temperature in the engine effective to generate a first potential signal representative of the instantaneous temperature of the responsive means and compensating means for the said signal effective to provide a compensated temperature signal, the compensating means comprising means for adding a function of the derivative of the first signal of the same sign as the derivative of the first signal, means for adding a function of the derivative of the rate of fuel flow to the engine of the same sign as the derivative of fuel flow rate, and means for subtracting a function of acceleration of the engine of the same sign as the acceleration.

3,893,292
POWER TURBINE DECELERATION CONTROL

Charles A. Amann, Bloomfield Hills, and Sidney G. Liddle, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 6, 1973, Ser. No. 385,951
Int. Cl. F02c 9/08
U.S. Cl. 60—39.27 4 Claims



1. A shaft power output gas turbine power plant comprising a compressor, combustion apparatus supplied with air by the compressor, a power output shaft, a turbine energized by the combustion apparatus connected to drive the compressor and to drive or be driven by the output shaft, a regenerator having substantial heat storage capacity normally connected to transfer heat from the turbine exhaust gas to the air flowing through a compressed air path from the compressor to the combustion apparatus, means for supplying fuel to the combustion apparatus, and operator-controllable power level control means regulating the fuel supplying means; in combination with means for reducing power output of the engine upon cutback in fuel supply including normally closed valve means connected to the outlet of the compressor effective upon opening of the valve means to divert a major portion of the air discharged from the compressor from flowing through the regenerator compressed air path; and control means responsive to the power level control means and to turbine speed effective to open the valve means at all times when the conditions that an idling power level is called for by the power level control and that turbine speed is above a predetermined idling speed level are both met and to close the valve means under all other conditions.

3,893,293
METHOD OF AND APPARATUS FOR CONTROL OF HELICOPTER GAS TURBINE ENGINE DURING AUTO ROTATION

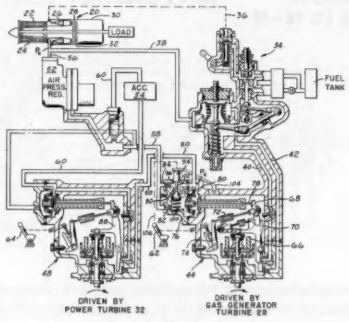
Robert G. Moore, Jr., South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Division of Ser. No. 193,385, Oct. 28, 1971, Pat. No. 3,777,478. This application July 26, 1973, Ser. No. 382,974
Int. Cl. F02c 9/08
U.S. Cl. 60—39.03 2 Claims

1. A method of controlling a helicopter gas turbine engine independently rotating gas generator and power output turbines and provided with a power control system including coacting first and second engine speed governor means wherein the first governor means is responsive to a first reference speed signal and speed of the gas generator turbine and the second governor means is responsive to a second reference speed signal and speed of power turbine, said method comprising the steps of:

establishing said first reference speed signal to govern said gas generator turbine at a selected speed;

establishing said second reference speed signal to govern said power turbine at a selected speed by generating an output speed error signal;



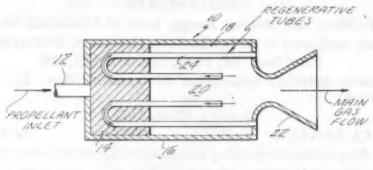
reducing said first reference speed signal to a predetermined relatively low setting to simulate an engine power failure for the purpose of helicopter practice auto-rotation;

rendering said second governor means inoperative simultaneously with said reduction in said first reference input signal to eliminate the control effect thereof on said power control system.

3,893,294
CATALYTIC MONOPROPELLANT REACTOR WITH THERMAL FEEDBACK

Eugene E. Bruun, Simsbury, and Ray A. Simmons, Enfield, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Sept. 10, 1973, Ser. No. 395,806
Int. Cl. F02k 9/02; F02c 3/20
U.S. Cl. 60—39.46 M 5 Claims

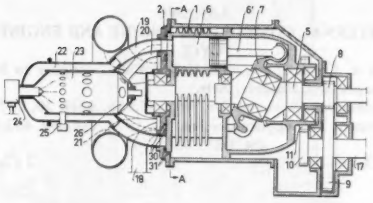


1. A monopropellant engine including an engine casing having a thermal reaction section, a gas generating section, and an injector for distributing monopropellant fuel into the reaction section, means for conducting the gases in said gas generating section to said thermal reaction section and then to a low pressure source, which pressure is lower than the pressures in the gas generating section, and said means being fabricated from material that effectively conducts heat from the gases passing therethrough to provide hot surfaces whereby the decomposition of said monopropellant injected into said thermal reaction section is enhanced.

3,893,295
EXTERNAL COMBUSTION SWASH PLATE ENGINE EMPLOYING ALTERNATE COMPRESSION AND EXPANSION IN EACH WORKING CYLINDER

Timo Airas, Parkgatan 3A, Helsinki, Finland

Filed Dec. 21, 1973, Ser. No. 427,190
Claims priority, application Sweden, Jan. 2, 1973, 7300021
Int. Cl. F02g *3/02*; F01b *3/02*
U.S. Cl. 60—39.63 4 Claims

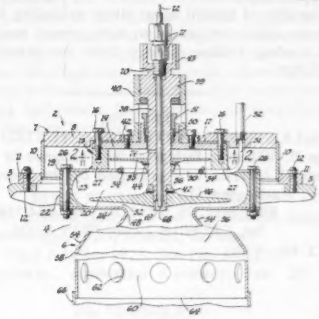


1. A combustion engine, comprising a stationary frame, a cylinder block comprising a plurality of cylinders mounted for rotation as a unit in bearings in said frame, a reciprocable piston element axially movable in each cylinder, a crankshaft rotatably mounted in said frame along the axis of rotation of said cylinder block, gear means mounted in said frame and connected between the cylinder block and crankshaft for giving the crankshaft a higher rotational speed than that of the cylinder block, swash plate rotatably mounted on said crankshaft and connected in timed relationship to said cylinder block to effect a desired relative rotation therebetween, a connecting rod between each piston element and said swash plate for converting the reciprocating movements of the piston elements into rotational movement of the crankshaft, a slide distributor comprising a pair of relatively rotatable slidably engaged interface members connected respectively to said frame and to said cylinder block, first port means in said cylinder block member of said slide valve distributor, and in flow communication with each of said plurality of cylinders; second port means in said frame member of said slide distributor comprising, in circumferential sequential order, air inlet port means for supply of inlet air to a cylinder when said air inlet port means is in flow communication with said first port means, compressed air discharge port means for discharge of compressed air from a cylinder when said compressed air discharge port means is in flow communication with said first port means, combustion products inlet port means for supply of combustion products to a cylinder when said combustion products inlet port means is in flow communication with said first port means, combustion products discharge port means for discharge of combustion products from a cylinder when said combustion products discharge port means is in flow communication with said first port means; air duct means connecting said compressed air discharge port means to said combustor; and combustion products duct means connecting said combustor to said combustion products inlet port means, said slide distributor being operative, during rotation of said cylinder block and corresponding relative rotation of the said interface member, to cause each cylinder and its associated piston to operate alternatingly as a compressor pumping air into the combustor via said air duct means and as a motor utilizing the expanding heated working medium supplied to each cylinder via said combustion products duct means.

3,893,296
COMBUSTION LINER

Hans P. Fredriksen, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 1, 1974, Ser. No. 484,652
Int. Cl. F02c *9/00*, *9/14*
U.S. Cl. 60—39.71 4 Claims

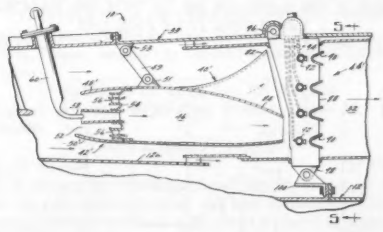


1. A combustion liner adapted for high energy combustion and with provisions for maintaining a desired equivalence ratio in the reaction zone, the liner having a closed upstream end and having a substantially circular cross-section, and comprising a radial-inflow primary air inlet swirler closely adjacent to the upstream end with flow through circumferentially distributed slots extending axially of the liner; a premixing chamber juxtaposed to and coaxial with the swirler and having a diameter greater than that of the swirler, the premixing chamber having a generally radial annular downstream wall converging to a throat; means defining a reaction zone connected to the premixing chamber through the throat; a first flow controlling disk reciprocable axially of the liner to close variably the air swirler slots to vary primary air flow; fuel spray means disposed at the upstream end of the premixing chamber; and a second flow controlling disk reciprocable toward and from the said downstream wall to vary flow area from the premixing chamber into the said throat.

3,893,297
BYPASS AUGMENTATION BURNER ARRANGEMENT FOR A GAS TURBINE ENGINE

Bemis Caldwell Tatem, Jr., and Robert Gordon Stabrylla, both of Cincinnati, Ohio, assignors to General Electric Company, Lynn, Mass.

Filed Jan. 2, 1974, Ser. No. 429,758
Int. Cl. F02k *3/02*
U.S. Cl. 60—224 12 Claims



1. A bypass gas turbine engine comprising:
an inner casing enclosing compressor means, combustion means and turbine means in serial flow relation;

an outer casing spaced apart from the inner casing defining a bypass duct therebetween;

a bypass augmentation burner stationed within the bypass duct for providing additional thrust augmentation to the gas turbine engine wherein the downstream end of the bypass burner is convoluted to define alternating hot and cold chutes, and

a plurality of spaced apart struts extending between the inner and outer casings so as to receive impingement of a cooling airflow directly from the plurality of cold chutes.

3,893,298

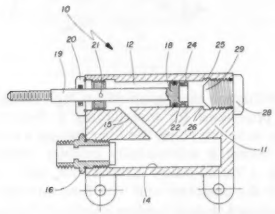
SINGLE-STROKE CARTRIDGE ACTUATED DEVICE

George B. Williams, Dahlgren, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 25, 1974, Ser. No. 454,358

Int. Cl.[2] F01B *29/08;* **F02N** *13/00*

U.S. Cl. 60—635 **4 Claims**



1. In a single-stroke, cartridge actuated device of the type having a piston which is axially movable within a cylindrical bore by virtue of gas generated by detonation of a cartridge, a non-return interference lock comprising:

a projection integrally formed on the forward end of said piston;

means fixed in the cylindrical bore opposite the forward end of said piston for deforming said projection beyond the yield point to an interference position when the piston reaches the end of its stroke; and

means for engaging the deformed projection to preclude return of said piston.

3,893,299

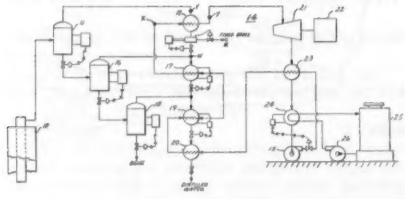
GEOTHERMAL HEAT RECOVERY BY MULTIPLE FLASHING

Arthur J. L. Hutchinson, Pasadena, and Douglas H. Cortez, Los Angeles, both of Calif., assignors to Geothermal Investment Co., South Pasadena, Calif.

Continuation-in-part of Ser. No. 301,258, Oct. 26, 1972, abandoned. This application Jan. 25, 1974, Ser. No. 436,443

Int. Cl. F01k *25/10;* **F03g** *7/00*

U.S. Cl. 60—641 **30 Claims**



1. A method of converting heat energy carried by brine to mechanical energy comprising the steps of:

passing the brine through successive flash chambers operating at progressively lower temperatures and pressures;

passing the steam from each flash chamber through an associated heat exchanger in heat exchange relationship with a working fluid to superheat the working fluid;

expanding the working fluid in a power extracting gas expansion device;

condensing the working fluid after expansion; and

circulating the working fluid in a closed loop including at least devices for heat exchange, gas expansion and fluid condensing.

3,893,300

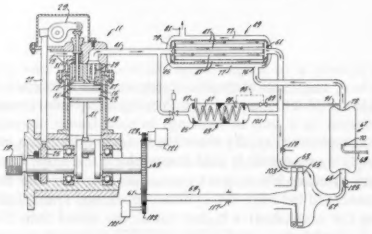
EXTERNAL COMBUSTION ENGINE AND ENGINE CYCLE

Joseph A. Connell, Fountain Valley, Calif., assignor to NRG Incorporated, Phoenix, Ariz.

Continuation-in-part of Ser. No. 355,956, April 30, 1973, abandoned. This application Jan. 10, 1974, Ser. No. 432,139

Int. Cl.[2] F02C *1/00*

U.S. Cl. 60—683 **2 Claims**



1. Apparatus for driving a vehicle, comprising in combination:

a combustion chamber for mixing air with fuel and burning this mixture to produce output combustion products;

means for supplying fuel under pressure to said combustion chamber;

a heat exchanger including first and second independent thermally interactive flow channels, said first flow channel connected at one end to said output combustion products of said combustion chamber, said first channel connected at its other end to an exhaust outlet;

a positive displacement compressor for compressing a fluid, the output of said compressor being conducted to one end of said second flow channel of said heat exchanger;

a fluid drive mechanism, the fluid inlet of which is connected to the other end of said second flow channel of said heat exchanger, said fluid drive mechanism adapted to drive said vehicle and said compressor; and

heat storage means connected to receive heat from the output combustion products of said combustion chamber, said heat storage means comprising:

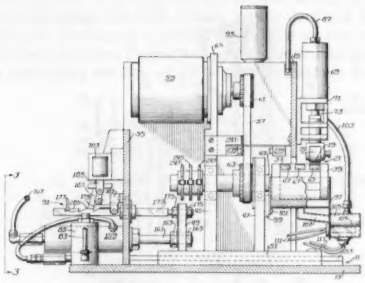
a heat storage element; and

a heat exchanger including first and second independent flow conduits, each of said flow conduits being thermally interactive with said heat storage element, said first flow conduit connected between said compressor and said fluid drive mechanism, said second flow conduit connected to said combustion chamber.

3,893,301
APPARATUS AND PROCESS FOR GRAPHIC IMAGE TRANSFER

Len A. Tyler, Evanston, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Division of Ser. No. 160,890, July 8, 1971, abandoned, which is a division of Ser. No. 695,228, Jan. 2, 1968, Pat. No. 3,612,685. This application Nov. 8, 1973, Ser. No. 414,065
Int. Cl. F02b *73/00*
U.S. Cl. 60—704 5 Claims

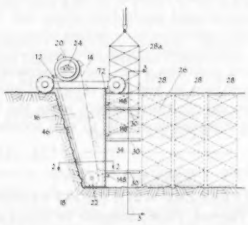


1. An indexing mechanism for intermittently delivering successive portions of a member to a relatively fixed station and comprising: A rack mounted for movement longitudinally thereof in a first direction for moving said member intermittently successive distances according to the pitch of rack notches; driven means for impelling said rack for movement; a detent arranged for selective engagement in said rack notches for holding said member from moving, and means for moving said detent from member-holding condition to permit said member to move, and means connected to said rack and rotationally supporting said member for movement longitudinally of said rack.

3,893,302
MACHINE AND METHOD FOR EXCAVATING TRENCHES AND FOR CONSTRUCTING WALLS IN TRENCHES

Carl R. Peterson, Boxford, Mass., assignor to Rapidex, Inc., Gloucester, Mass.

Filed Oct. 25, 1973, Ser. No. 409,726
Int. Cl. E02d *5/20*; E02f *5/06*
U.S. Cl. 61—35 24 Claims

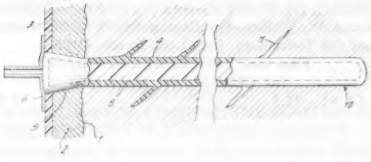


1. In the method of excavating a trench in the earth, said method comprising inserting in the earth an excavating machine of a height corresponding to the depth of the trench desired, said excavating machine having a hydraulic thrust surface facing rearwardly relative to the direction of intended advance of the machine, operating said excavating machine to excavate the trench, and filling the trench immediately behind the excavating machine with fluid, the excavating machine preventing entry of equilibrating fluid to its forward side, whereby pressure exerted by said filling fluid upon said thrust surface applies forward propulsive force to said excavating machine to assist it in its operation, that improvement wherein said filling fluid is fluid concrete, the placing of said concrete in said trench to apply forward propulsive force to the excavating machine serving to continuously cast a wall in the trench and including use of means to exert hydraulic pressure in the fluid concrete at said hydraulic thrust surface in excess of the pressure attributable to the weight of fluid concrete in said excavated trench, said means extending rearwardly of the machine over the filled trench to the point where the concrete has hardened sufficiently to withstand said excess pressure, the resulting hydrostatic force assisting in propelling said excavating machine forward.

3,893,303
ROCK SECURING METHOD

Ernst Rotter, Kaprun, near Zell am See, Austria, assignor to R.u.A. Hinteregger oHG, Munich, Germany

Filed July 24, 1973, Ser. No. 382,211
Claims priority, application Germany, July 25, 1972, 2236457
Int. Cl. E01g *5/10*
U.S. Cl. 61—45 B 6 Claims



1. In the method of securing rock faces in which a curable plastic resin is injected into holes in the face, the improvement which comprises applying a covering layer of curable plastic to the face prior to boring the holes, boring the holes through the covering layer into the rock face with a frustroconical shape so that the diameter of the hole on the surface of the covering layer is greater than the diameter of the bore shaft, injecting a curable plastic resin under pressure into the holes so that the hole is filled with curable plastic resin in the bore shaft and in the frustroconical portion, curing the curable plastic of the covering layer, and curing the curable plastic resin in the holes to form a plurality of plastic plugs in said holes having frustroconical portions in close contact with the covering layer, whereby said covering layer is securely held against the rock face by the frustroconical portions of the plastic plugs.

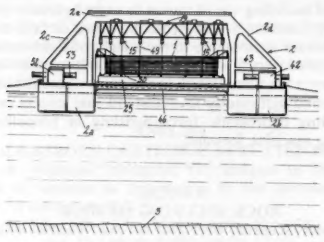
3,893,304
METHOD AND A DEVICE FOR THE UNDERWATER CONSTRUCTION OF CONCRETE STRUCTURES

Leonid Pochitaloff-Huvale, and Alexandre Domboy, both of Paris, France, assignors to Leonid Pochitaloff-Huvale, Paris, France

Filed June 28, 1973, Ser. No. 374,506
Claims priority, application France, July 21, 1972, 72.26360
Int. Cl. E02d *27/38*, *29/00*
U.S. Cl. 61—46 25 Claims

1. A method for building at least partially immersed structures by pouring concrete or any like hardenable material, wherein a flexible and leak-tight jacket is placed in position at the intended location, wherein at least part of the internal space of said jacket is filled with a liquid ballast having the design function of applying to the jacket walls a pressure which is higher than the ambient hydrostatic pressure, wherein the internal space of the jacket which is thus filled

corresponds substantially to the casting space of the structure to be built, and wherein the concrete or like hardenable mate-



rial is then poured into the jacket while discharging the liquid ballast which had been present therein.

3,893,305

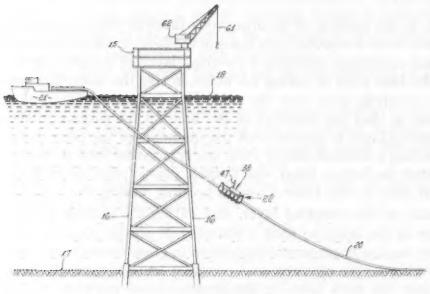
METHOD OF BENDING A CONTINUOUS FLOWLINE

Raymond W. Walker, Huntington Beach, Calif., assignor to Deep Oil Technology, Inc., Long Beach, Calif.

Filed Oct. 1, 1973, Ser. No. 402,058

Int. Cl. F16l *1/00;* **B21d** *7/00*

U.S. Cl. 61—72.3 **7 Claims**



1. In a method of terminating a flowline at an offshore structure with an upstanding end portion of the flowline to be attached to the structure comprising, the steps of:

trailing a flowline from a moving vessel to the sea floor alongside and past an offshore structure to which the flowline is to be attached;

attaching a flowline bending unit to a selected portion of said flowline along its length, said portion to be located at the bottom of the offshore structure;

carrying said bending unit on said flowline as the flowline is being laid;

actuating from a remote location the flowline bending unit; imparting bending forces to opposite ends of the bending unit to bend the portion of the flowline to be located adjacent the bottom of the offshore structure;

moving the end portion of the pipe into upstanding position alongside the offshore structure during such bending and providing a bend of selected arc in said flowline portion at said sea bottom;

and securing the upstanding portion of the pipe to the offshore structure.

3,893,306

REFRIGERATOR CONTROL ARRANGEMENT

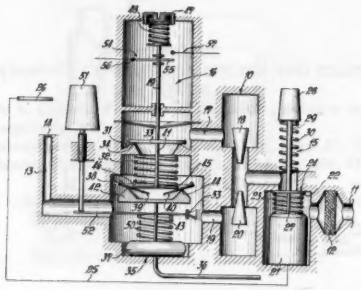
Ulrich Kroll; Josef Schmid, both of Wernau(Neckar), and Siegfried Vollprecht, Boll, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Jan. 12, 1973, Ser. No. 323,312

Claims priority, application Germany, Jan. 25, 1972, 2203295

Int. Cl. F25b *15/10*

U.S. Cl. 62—148 **23 Claims**



1. In a refrigerator comprised of a cooling compartment on the walls of which frost tends to form, an arrangement for counteracting such tendency, comprising, in combination, temperature changing means operative in a first mode for causing a decrease of the temperature of said cooling compartment and operative in a second mode for causing an increase of the temperature of said cooling compartment; and control means operative for maintaining said compartment cool by causing said temperature changing means to assume said first mode when the temperature of said cooling compartment rises to a higher first value, and operative for counteracting the accumulation of frost on said walls by causing said temperature changing means to assume said second mode when the temperature of siad cooling compartment will alternate between said first and second values, said control means including a control member movable between first and second positions for respectively causing said temperature changing means to assume said first and second modes, biasing means connected to said control member comprising a bistable snap-over spring member coupled to said control member and so disposed that said snap-over spring member must be snapped over to a first position and to a second position for respectively permitting said control member to be moved to said first and second positions of said control member, and temperature-responsive means operative for exerting upon at least one of said members a temperature-dependent force moving said members to said first positions when the temperature of said cooling compartment rises to said first value and moving said members to said second positions thereof when the temperature of said cooling compartment falls to said second value.

3,893,307

REFRIGERATOR FREEZER WITH FROST ELIMINATOR

James W. Jacobs, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

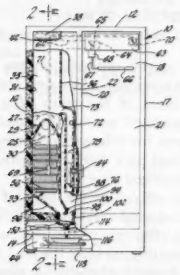
Filed May 3, 1974, Ser. No. 466,684

Int. Cl. F25d *21/00*

U.S. Cl. 62—150 **3 Claims**

1. A refrigerator comprising an insulated cabinet, an insulated vertical partition wall extending from top to bottom of said cabinet to provide separate vertical side-by-side fresh food and frozen food compartments, an upright evaporator chamber associated with the frozen food compartment rear wall containing an evaporator, a fan having an inlet connected

to said evaporator chamber and having an outlet connected to both an upwardly extending cold air supply duct and a downwardly extending evaporator cold air diverter duct, a Venturi mixing nozzle located in said diverter duct, a frozen food compartment air return duct positioned in spaced relation around the lower portion of said diverter duct having its inlet disposed vertically below said fan, said air return duct defining a mixing chamber between the exit of said diverter duct and the bottom wall of said frozen food compartment, said cold air supply duct having an outlet for discharging part of the cold air therethrough, a crossover duct extending through the upper portion of said partition wall and having an air inlet communicating with said cold air supply duct and having an outlet for discharging a portion of the cold air into said fresh food compartment, thermostatically controlled damper means for controlling the flow of air from said crossover duct outlet



to said fresh food compartment, passage means for returning air from the lower portion of said fresh food compartment to the throat portion of said Venturi nozzle, whereby below freezing diverter duct air flowing downwardly through said Venturi nozzle draws above freezing air from said fresh food compartment through said passage means into said throat for mixture with said air therewith, said air return duct having an outlet communicating with both subjacent crystallized water collecting means and the inlet of said evaporator chamber, whereby moisture in the combined return air is frozen by the diverter duct air flow while airborne, and means for separating the crystallized water from the combined return air during its flow from said mixing chamber for deposit into said collecting means prior to the combined return air flows being drawn upwardly into said evaporator chamber to minimize the formation of frost on said evaporator.

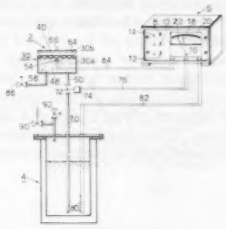
3,893,308

FREEZING APPARATUS PARTICULARLY USEFUL FOR FREEZING SPERMATOZOA

Joseph Barkay, Tiberias; Henryk Zuckerman, Afual, and Nachman Pundak, En Harod (Ihud), all of Israel, assignors to Ricor, Ltd., En Harod (Ihud), Israel

Filed Mar. 13, 1974, Ser. No. 450,783
Claims priority, application Israel, Mar. 23, 1973, 41856
Int. Cl. C12k *1/08*
U.S. Cl. 62—223 **8 Claims**

1. Freezing apparatus particularly useful for producing frozen pellets of a liquid medium containing spermatozoa frozen at a preselected temperature, comprising: a housing closed at the bottom and open at the top; a removable, heat-conductive, freezing plate resting on the top of the container and closing same to define a freezing chamber therewith; said freezing plate being formed with a plurality of recessed circular pockets each for receiving a portion of the liquid medium to be frozen into pellets, said freezing plate being removable with the frozen pellets from the housing; said chamber having an inlet and an outlet for introducing and removing a coolant gas; a temperature-sensitive device disposed within said freezing chamber; a container containing a coolant liquified gas and including an inlet line connected to said chamber inlet; an outlet line connected to said chamber outlet; a valve included in one of said lines for controlling the flow of coolant gas to the freezing chamber; a controller including a temperature



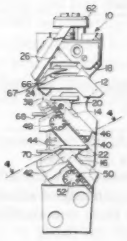
presetting device; and means responsive to the temperature-sensitive device in the freezing chamber for controlling said valve, and thereby the temperature of the freezing chamber, in accordance with the temperature presetting device.

3,893,309

BRIDGING CAM FOR LIMITING THE POSITION OF WELT NEEDLES IN A KNITTING MACHINE

John Christopoulos, Brentwood, N.Y., and Lester Mishcon, Miami Beach, Fla., assignors to The Singer Company, New York, N.Y.

Filed Nov. 12, 1973, Ser. No. 415,035
Int. Cl.[2] **D04B** *9/00*
U.S. Cl. 66—40 **10 Claims**

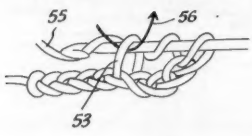


1. In camming for a knitting machine, the combination comprising a wing cam; a stitch cam separated by a gap from the wing cam; a needle with a butt engageable by both said wing and stitch cams when the needle is permitted to welt, said needle being movable beyond the trailing edge of the wing cam and across said gap to the stitch cam, the needle also including another butt; and a bridging cam engageable with said another butt throughout movement of the needle between the trailing edge of the wing cam and the stitch cam whereby movement of the needle toward a knit or tuck position is restricted while the needle moves across said gap.

3,893,310
TRICOT CROCHET FABRIC AND ITS METHOD OF MANUFACTURE

Christa Ursula Palfy, 31/98 Ourimbah Rd., Mosman, New South Wales, Australia

Continuation-in-part of Ser. No. 299,724, Oct. 24, 1972, abandoned, which is a continuation of Ser. No. 70,106, Sept. 8, 1970, abandoned. This application Jan. 8, 1974, Ser. No. 431,769
Int. Cl. D04b *1/00*
U.S. Cl. 66—169 R 6 Claims

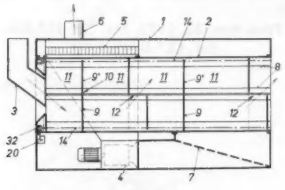


1. A method of Tricot stitching wherein the fabric is worked in rows comprising treble stitches, in which each treble is completed by an integral chain stitch thereby to maintain the stitches at right angles to the rows.

3,893,311
DRUM-TYPE MACHINE FOR THE TREATMENT OF TEXTILE MATERIAL

Arnfried Meyer, Neckargartacherstrasse, 7101 Frankenbach, Germany

Filed May 21, 1973, Ser. No. 362,292
Claims priority, application Austria, May 19, 1972, 4421/72
Int. Cl. D06f *37/08*
U.S. Cl. 68—143 39 Claims

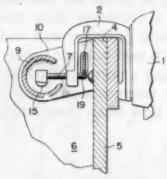


1. Apparatus for the batchwise treatment of textile material and the like comprising:
a housing,
a material accommodating drum mounted in said housing for rotation about a drum axis,
and at least one partition means for subdividing the interior of said drum into a plurality of separate treatment chambers spaced axially from one another in the direction of said drum axis,
each of said partition means including a plurality of part disk members which extend substantially perpendicular to said drum axis and which together substantially fill the cross-section of the interior of said drum, at least one of the part disk members forming a respective partition means being axially movable relative to said drum and in a direction parallel to said drum axis between a closed partition position with said respective part disk members at the same axial position along said drum axis to form a substantially closed partition wall which prevents axial movement of the material being treated to the next adjacent treatment chamber and an open partition position with said at least one axially movable part disk member axially spaced from other of said respective part disk members to permit passage of the material being treated to the next adjacent treatment chamber.

3,893,312
LOCK DEVICE FOR MARINE OUTBOARD MOTOR

Leo D. Johnson, Powell River, British Columbia, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Aug. 12, 1974, Ser. No. 496,465
Int. Cl.[2] E05B *73/00*; F16B *41/00*
U.S. Cl. 70—58 2 Claims

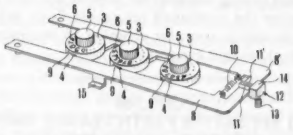


1. A lock device for a marine outboard motor having substantially U-shaped clamp arms affixed thereto and accommodating the upper open sheet of the stern of a small boat therein, and manually operated screws threadedly movably mounted in the clamp arms for releasably affixing the motor to the stern of the boat, said lock device comprising
a substantially semicylindrical pipe;
a pair of end members affixed to the ends of the pipe in substantially parallel spaced relation extending substantially perpendicular to the axis of the pipe; and
locking means for releasably locking the end members to the clamp arms in a manner whereby the pipe covers the heads of the manually operated screws thereby preventing unscrewing thereof and removal of the motor from the boat.

3,893,313
CASE

Sanzo Kobayashi, No. 34-9, Ryusen 3-chome,, Taito-ku, Tokyo, Japan

Filed Aug. 9, 1972, Ser. No. 279,061
Claims priority, application Japan, Nov. 17, 1971, 46-107708
Int. Cl. E05b *65/52*, *37/12*
U.S. Cl. 70—63 3 Claims



1. A case of a covering type characterized by the structure in which the housing(2) is provided on the ceiling wall of the lid(1), a plurality of disc(3) being freely rotatably supported on the axis, the fixing indentations(4) and (4′) being provided at the symmetrical position in the periphery of the disc(3), the knob(5) being provided to the surface of each disc(3), a part of the knob(5) being protruded through the surface of the ceiling wall(2′) of the housing(2), the signs(6) such as numerals being marked on the surface of the cocentric circle of each disc(3) so that one of the signs can be seen through the display window(7) provided to the ceiling wall(2′) of the housing(2), a pair of swing levers(8) and (8′) provided with fixing projections(9) and (9′) which engage or disengage with said fixing indentations(4) and (4′) being located on the inner edge of the both sides of the disc(3) in the housing(2) with one end of each swing lever supported freely rotatably on the axis, the free end of each swing lever being provided with the spring(10) which attracts both ends together, the split member(12) being provided between the joints(11) and (11′) formed at said free ends so that split condition can be main-

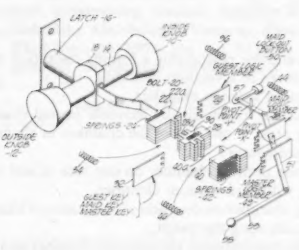
tained by means of the spring element(13), the operating button(14) being provided on the surface of the split member(12), a part of the operating button(14) being protruded through the ceiling wall(2') of the housing(2), the hooked projections(15) and (15') turning outward being provided on the underside in the middle between said swing levers(8) and (8'), and the tip of the hooked projections(15) and (15') are protruded through the holes (16) and (16') from the lower wall(2'') of the housing(2) toward the underside so that the hooked projections(15) and (15') can be unlocked at the connections(18) and (18') provided to the case proper(17) when all the fixing projections(9) and (9') fix into the fixing indentations(4) and (4') and locked when at least one of the fixing projections(9) and (9') is released from the fixing indentations(4) and (4').

3,893,314

LOCK ASSEMBLY

James W. Raymond, 300 Avenida Cumbre, Newport Beach, Calif. 92660

Filed Feb. 1, 1974, Ser. No. 438,867
Int. Cl. E05b *25/00, 29/02*
U.S. Cl. 70—339 **8 Claims**



1. A lock assembly including: a casing; a first plurality of tumblers mounted in said casing and individually settable to different positions established by a first logic member; a second plurality of tumblers mounted in said casing and individually settable to different positions established by a key, said tumblers of said second plurality permitting movement of said tumblers of said first plurality relative thereto only when the positions of the tumblers of said first plurality have a predetermined relationship with respect to the positions of the tumblers of said second plurality; and a third plurality of tumblers mounted in said casing and individually settable to different positions established by at least one further logic member, said tumblers of said third plurality permitting movement of said tumblers of said second plurality relative thereto only when the positions of the tumblers of said second plurality have a predetermined relationship with the positions of said tumblers of said third plurality.

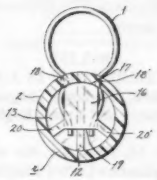
3,893,315

KEY HOLDER

Emil W. Kamp, 242 Palm Dr., St. Louis County, Mo. 63141

Filed Aug. 23, 1973, Ser. No. 390,905
Int. Cl.² A44B *15/00*
U.S. Cl. 70—456 R **2 Claims**

1. A key holder comprising a key ring formed from wire stock and having a loop-forming portion and a pair of spaced-apart legs continuous with said portion, a discoidal retainer body having a rim comprising an outer peripheral wall, an inwardly radially spaced inner peripheral wall and opposed exterior surfaces between said inner and outer peripheral walls, said rim having a pair of openings extending therethrough from said outer peripheral wall through said inner peripheral wall, an elongated partition member provided interiorly of said retainer body with opposite sides thereof aligned respectively with the said openings, said inner peripheral wall being annular, said partition member extending between diametrically opposed points on said inner peripheral wall, said key ring legs projecting through said openings and being presented on opposite sides of said partition member, an annular, flat, uniplanar, relatively rigid plate integral with one side of said partition member with its plane being parallel to the major axis of said partition member, said inner peripheral wall being provided with undercut portions, said plate being integral at its periphery with the said inner peripheral wall, and being located inwardly of the undercut portion proximate thereto, a first indicia-bearing member presented flatwise upon said annular plate, and a first protective transparent member disposed coveringly of said first indicia-bearing member, said first indicia-bearing member and said first protective transparent member having peripheral portions received within the proximate undercut portion of said inner peripheral



wall, a second plate presented in planar parallel relationship to said annular plate and being disposed integral to the opposite side of said partition member, said second plate having an area less than that of said annular plate with portions of its periphery spaced from said inner peripheral wall, said second plate being integral with said inner peripheral wall at spaced apart points between the said portions of its periphery spaced from said inner peripheral wall, and further characterized by said co-ordinating plate projecting beyond opposite lateral portions of said partition member a distance sufficient to partially overlie the received key ring legs whereby the latter are retained between said first and second plates, further characterized by the engaged portions of the second plate to said inner peripheral wall constituting a portion thereof proximate the pair of rim openings and arms extending from said second plate to the inner peripheral wall at spaced-apart points from each other and from the portion engaging said wall proximate the pair of rim openings.

3,893,316

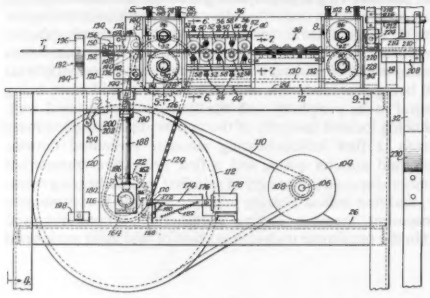
BALE TIE STRAIGHTENING APPARATUS

Emil Simich, Chicago, Ill., assignor to A. J. Gerrard and Company, Des Plaines, Ill.

Filed Nov. 7, 1974, Ser. No. 521,578
Int. Cl.² B21D *3/02;* **B21F** *1/02*
U.S. Cl. 72—2 **14 Claims**

1. For use in straightening a bale tie, apparatus comprising frame means, a first straightener unit supported by said frame means and including freely-rotatable roller means for orienting the axis of the bale tie in a first plane, a second straightener unit supported by said frame means and including freely-rotatable roller means for orienting the axis of the bale tie in a second plane normal to said first plane, a forward drive unit supported by said frame means and including drive rollers for engaging the bale tie and advancing the same through said first and second straightener units, a rearward drive unit supported by said frame means and including drive rollers for engaging the portion of the bale tie leaving said second straightener unit and drawing the bale tie through said first and second straightener units, main drive means for driving said forward and

rearward drive units, severing means forwardly of said forward drive unit for severing the bale tie being straightened, and



selectively operable auxiliary drive means for effecting actuation of said severing means.

3,893,317

ECCENTRICITY CORRECTION IN A ROLLING MILL

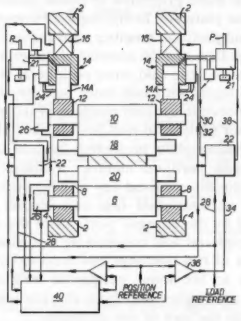
Robin Clarke, Sheffield, England, assignor to Davy-Loewy Limited (formerly Davy and United Engineering Co.), Sheffield, England

Filed Apr. 10, 1974, Ser. No. 459,584

Claims priority, application United Kingdom, Apr. 10, 1973, 17126/73

Int. Cl. B21b *37/00*

U.S. Cl. 72—20 **11 Claims**



1. A method of detecting and correcting for the total eccentricity of two operative rolls in a rolling mill, which rolls differ slightly in diameter, lie on opposite sides of a gap through which a material is to be passed, and are responsible for the bulk of the eccentricity of all the rolls of said mill, said rolling mill comprising roll gap adjusting means and said method comprising the steps of

rotating said rolls for a period of time equal to at least one beat cycle in which the smaller of said rolls rotates through exactly one revolution more than the other of said rolls with the roll gap reduced to zero and the rolls under load, while

continuously supplying signals representing the sum of the eccentricities of said rolls and signals representing the angular position of each of said rolls to a computer which is programmed to calculate and store for each of said rolls data representative of the eccentricity at specific points spaced equally around its periphery, and

subsequently rotating said rolls with said material being rolled between said rolls while supplying signals representative of said sum of said eccentricities from said computer in synchronism with said subsequent rotation of said rolls to said roll gap adjusting means to bring about adjustment of the roll gap in a direction which compensates for the eccentricity of both rolls.

3,893,318

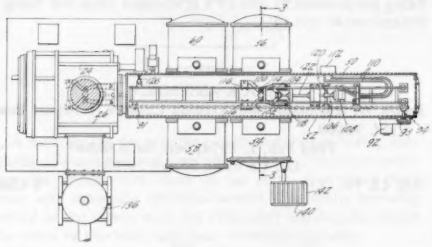
FORGING APPARATUS

Robert E. King, Jr., West Willington, and Clifford B. Turner, East Hampton, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed July 17, 1974, Ser. No. 489,288

Int. Cl. B21j *1/06, 13/10, 17/00*

U.S. Cl. 72—38 **10 Claims**



1. Apparatus for performing a forging operation on successive workpieces in a vacuum including

an elongated vacuum chamber,

a manipulator longitudinally movable in said chamber,

a forging press at one end of the chamber in alignment with the manipulator,

at least one preheat chamber on one side of and communicating with said vacuum chamber,

a loading chamber on one side of said vacuum chamber and communicating therewith,

a closable gate between the vacuum chamber and the loading chamber,

a slide in each of said preheat chambers and said loading chamber movable linearly at right angles to the manipulator,

a loading door providing access to said loading chamber, and

means for creating a vacuum in said loading chamber independently of the vacuum in the vacuum chamber.

3,893,319

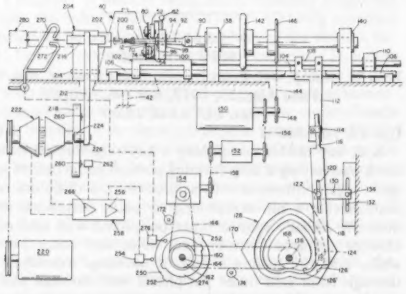
BAND MAKING APPARATUS

Mario Zaltron, Vicenza, Italy, assignor to Evinger Corporation, Providence, R.I.

Filed Jan. 28, 1974, Ser. No. 436,915

Int. Cl. B21c *37/12*

U.S. Cl. 72—49 **10 Claims**



1. Band making apparatus, comprising

a mandrel having an axis,

a source of wire, said wire having a pair of oppositely opening longitudinal channels, said source including means for presenting said wire to said mandrel with said channels opening in opposite directions transverse to said axis,

a guide arranged to fit into one of said channels,

means for relatively rotating said mandrel and said guide about said axis of said mandrel to wind said wire about said mandrel,

means for biasing said guide toward said mandrel to hold said wire against said mandrel,

means for providing a relative traverse motion between said guide and said mandrel during the relative rotation thereof, and

means for controlling the rates of said relative rotation and said traverse motion in accordance with the dimensions of said wire to produce channel-to-channel interlock of successive turns of said wire on said mandrel.

3,893,320
EXTRUSION PRESS FOR HYDROSTATIC EXTRUSION WITH A BILLET-HOLDING PISTON IN THE PRESSURE CHAMBER

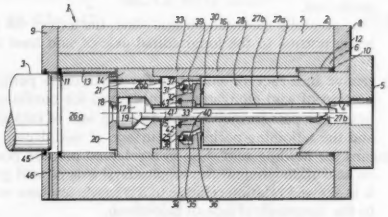
Pertti Syvakari, Helsingborg, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Sept. 30, 1974, Ser. No. 511,301

Claims priority, application Sweden, Oct. 12, 1973, 73138745

Int. Cl.² B21C *23/08*

U.S. Cl. 72—60 **3 Claims**



1. Press for hydrostatic extrusion of tubes comprising a press stand, a pressure chamber comprising a high-pressure cylinder displaceably arranged in the press stand, a die support, a die held by such holder sealing one opening of the cylinder, said die having an opening for forming a profile, and a punch insertable in the other opening of the cylinder for generating a pressure within a pressure medium enclosed in the pressure chamber and surrounding a billet for extrusion of the billet, a mandrel in the pressure chamber, a billet holder shaped like a piston dividing the pressure chamber into two spaces and having an opening for the mandrel, said piston holding the billet and the die pressed against the die support while the pressure chamber is closed, the billet holder having means thereon sealingly engageable against a billet in the pressure chamber, thereby separating a first space between the billet and the cylinder wall from a second space between the billet and the mandrel, a first and a second flow path through the billet holder opening out into the first and the second spaces, respectively, and valve means in the flow paths which open the flow paths at different pressure differences between the spaces on both sides of the billet holder.

3,893,321
SWAGING MACHINE

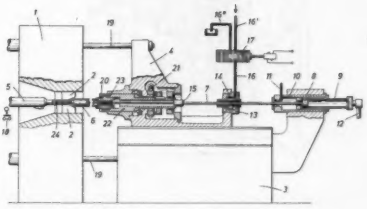
Johann Braunwieser, Steyr, Austria, assignor to GFM Gesellschaft fur Fertigungstechnik und Maschinenbau Aktiengesellschaft, Steyr, Austria

Filed Oct. 18, 1974, Ser. No. 516,009

Claims priority, application Austria, Dec. 4, 1973, 10147/73

Int. Cl.² B21K *21/08*

U.S. Cl. 72—76 **7 Claims**



1. A swaging machine for manufacturing a tubular workpiece having an elongated, internally cylindrical, intermediate workpiece portion and opposite workpiece end portions differing in inside diameter from said intermediate workpiece portion, said machine comprising

die means defining a swaging zone and operable to swage a tubular workpiece in said swaging zone,

a feeding head and a holder-up, which are spaced apart and adapted to engage opposite ends of said tubular workpiece and to grip the same, said feeding head being operable to advance a workpiece thus gripped in its longitudinal direction through said swaging zone, said holder-up being adapted to yield to the workpiece as it is thus advanced,

a mandrel rod extending through said feeding head,

a mandrel carried by said mandrel rod and adapted to extend in said workpiece in the longitudinal direction thereof and having opposite mandrel end portions which have outside surfaces conforming to the inside surfaces of respective ones of said workpiece end portions, said mandrel also having a cylindrical intermediate mandrel portion, which has an outside diameter that is equal to the inside diameter of said intermediate workpiece portion and which has a length that is larger than the corresponding dimension of said swaging zone and substantially smaller than the length of said intermediate workpiece portion, and

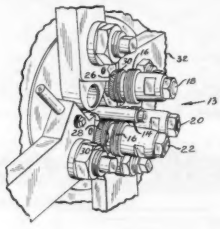
control means which when said mandrel extends in said workpiece serve to couple said mandrel rod to said feeding head, so that said mandrel advances in unison with said workpiece, when a workpiece portion intended to form one of said workpiece end portions extends in said swaging zone, to hold said mandrel rod and mandrel in a fixed position when a workpiece portion intended to form said intermediate workpiece portion extends in said swaging zone, and in response to the displacement of said holder-up as it yields to the advancing workpiece to couple said mandrel rod to said feeding head, so that said mandrel advances in unison with said workpiece, when a workpiece portion intended to form the other of said workpiece end portions extends in said swaging zone.

3,893,322

METHOD FOR PROVIDING IMPROVED NUCLEATE BOILING SURFACES

Bonnie J. Campbell, and Klaus K. Rieger, both of Decatur, Ala., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Aug. 21, 1974, Ser. No. 499,344
Int. Cl. B21h *3/12*
U.S. Cl. 72—98 5 Claims



1. A process for improving the heat transfer capability of a metal heat transfer surface comprising the steps of:

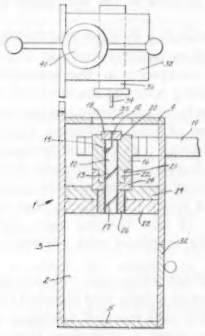
Knurling at least a portion of said heat transfer surface and then subjecting said knurled portion to a finning operation.

3,893,323

APPARATUS FOR FORMING CUTTING TOOL FACES

Dennis Harry Wale, Leicester, England, assignor to Marwin Cutting Tools Limited, Rothley, England

Continuation of Ser. No. 397,844, Sept. 17, 1973, abandoned, which is a continuation of Ser. No. 235,434, March 16, 1972, abandoned, which is a continuation of Ser. No. 863,841, Oct. 6, 1969, abandoned. This application Aug. 26, 1974, Ser. No. 500,283
Int. Cl. B21d *11/06*
U.S. Cl. 72—128 6 Claims



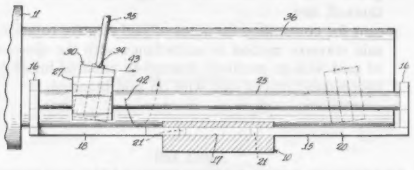
1. Apparatus for shaping a helical face piece for an engineer's tool comprising a core, a feed slot in the surface of said core in the shape of a piece of hard cutting material to be shaped, means for heating hard cutting material in the feed slot up to a temperature at which the material is hot deformable, a continuation of the feed slot in the shape desired in the finished piece, the continuation being long enough to allow the piece to cool to a temperature at which the material is no longer deformable, and means for feeding a piece of material into the feed slot.

3,893,324

SPIRAL WINDING APPARATUS

Charles W. Cappell, Allison Park, Pa., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Aug. 13, 1973, Ser. No. 387,777
Int. Cl.[2] B21F *3/04*
U.S. Cl. 72—143 6 Claims



1. Apparatus for winding an elongated deformable member, such as a rod or tube, to spiral formation, comprising:

a rotatable drum upon which said elongated member is to be wound,

a slide support comprising an elongated base member and upstanding end members fixed to opposite ends of said base member, said base member being fixed in position so that its longitudinal axis is spaced from but parallel to the longitudinal axis of said drum,

a slide, a guide rod carried by and extending between said end members, the longitudinal axis of said guide rod being spaced from but parallel to the longitudinal axis of said drum, said slide being freely movable along said guide rod,

a shoe pivotally mounted on said slide, the axis of the pivot being normal to the longitudinal axis of said base member,

a groove in a face of said shoe for receiving a peripheral portion of said elongated member and for confining the latter in a pass formed by the defining wall of said groove and the adjoining peripheral surface of said drum,

means for holding said shoe in a selected pivoted position on said slide wherein the longitudinal axis of said groove is in skewed relation relative to a transverse plane normal to the longitudinal axis of said drum,

means for holding one end of said elongated member for rotation with said drum whereby drum rotation draws succeeding portions of said elongated member through said groove and spirally winds said member about said drum, sliding movement of said elongated member through said groove generating a force component which moves said slide support in the direction of the spiral winding and in an amount corresponding to the skewed relation of said groove.

3,893,325

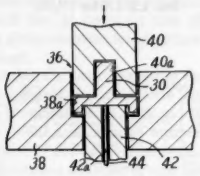
PROCESS FOR MANUFACTURING A BASE FOR A SEMICONDUCTOR DEVICE

Yoshio Sato, No. 23-15, 3-chome, Zenpukuji, Suginami-ku, Tokyo, Japan

Filed July 5, 1974, Ser. No. 486,083
Claims priority, application Japan, July 10, 1973, 48-77051; Nov. 22, 1973, 48-130727
Int. Cl. B21j *13/02*
U.S. Cl. 72—344 9 Claims

1. A process for manufacturing a base for a semiconductor device having a recess in the base on the upper surface to receive semiconductor means therein and a threaded stem extending from the bottom of the base, said process comprising the steps of preparing a blank of metal material; deforming by extrusion said blank with a shallower recess portion formed

in said blank on the upper surface and with a shorter stem portion extending from said blank at the bottom while forming a projection on the bottom of said shallower recess portion in said blank; further deforming said blank so that said recess



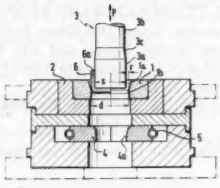
portion in said blank is deepened whereby said recess is formed in said base and so that said stem portion is lengthened whereby an unthreaded stem is formed; and threadedly rolling said stem on said blank.

3,893,326

APPARATUS FOR REDUCTION DRAWING OF HOLLOW BODIES OF STAINLESS STEEL

Karl-Oskar Oberländer; Christian Domscha, and Werner Schurr, all of Geislingen/Steige, Germany, assignors to Wurttembergische Metallwarenfabrik, Geislingen/Steige, Germany

Filed Nov. 13, 1973, Ser. No. 415,312
Claims priority, application Germany, Nov. 16, 1972, 2256334; Mar. 29, 1973, 2315832
Int. Cl. B21d *22/20*
U.S. Cl. 72—347 **1 Claim**



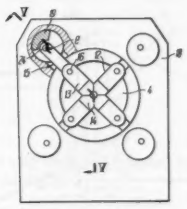
1. In an apparatus for producing hollow bodies of stainless steel, the combination of an axially reciprocable ram and a surrounding die assembly cooperable with said ram so as to reduction deep draw a cup-shaped stainless steel blank, said die assembly comprising a stationary support and an annular die member of ceramic material fixedly mounted thereon, and said ram having a forward plunger portion and an attenuated axial portion tapering rearwardly from said forward portion, the peripheral exterior surface of said ram being cooperable with the peripheral interior surface of said blank, and the peripheral exterior surface of said blank being cooperable with the inner edge of said ceramic die member so that by an initial forward movement of said ram a peripheral wall portion of said blank at its closed end will be drawn to an axially extended length of radially reduced wall thickness and so that continued forward movement of said ram will deform the free end of said blank into a rearwardly extending annular rim of inwardly increasing radial thickness, thereby gradually reducing the radial outward load upon said ceramic die member; and stripping means for axially withdrawing said extended and deformed blank forwardly from said ram.

3,893,327

RADIAL-SWAGING MACHINE

Nikolai Alexandrovich Fedorov, ulitsa Kardasheva 2, kv. 24; Leonid Andreevich Butenko, ulitsa akademika Karpinskogo, 1, kv. 12, and Vadim Vladimirovich Kazak, ulitsa Kirova, 24, kv. 47, all of Voronezh, U.S.S.R.

Filed Sept. 20, 1973, Ser. No. 399,118
Int. Cl. B21d *41/04*
U.S. Cl. 72—402 **3 Claims**



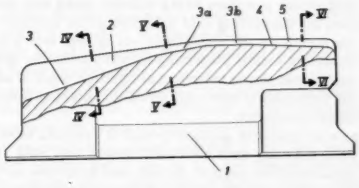
1. A radial-swaging machine, comprising: a bed; a spindle mounted on said bed; a drive connected to said spindle to bring oscillating motion to it; said spindle incorporating an axial passage for the advancement of a billet being swaged, and radial slots; slides accomodated in said slots; striking heads fixed on those ends of said slides which face said axial passage of the spindle; levers whose number is equal to that of said slides, each of these levers located adjacently to its own slide and with its one end is pivotally connected to the latter while with the other, to said bed; said levers bringing reciprocating motion to said slides carrying said striking heads in said slots in the course of the oscillating motion of the spindle.

3,893,328

SWAGING TOOL

Gottfried Blaimschein, Steyr, Austria, assignor to GFM Gesellschaft fur Fertigungstechnik und Maschinenbau Aktiengesellschaft, Steyr, Austria

Filed May 9, 1974, Ser. No. 468,398
Claims priority, application Austria, May 17, 1973, 4341/73
Int. Cl. B21j *13/02*
U.S. Cl. 72—404 **3 Claims**



1. A tool for use in a swaging machine for swaging four-sided bar stock, said tool comprising a tool member having a hammer face formed with an elongated groove open in both longitudinal directions, the cross section of said groove at one longitudinal end being V-shaped, and said groove having a flat bottom wall at the other longitudinal end, lateral bead portions of said tool member projecting from said bottom wall at the other longitudinal end of said groove and constituting side walls of said groove, said -shaped cross section bringing reciprocating along said groove into said bottom wall and said side walls.

3,893,329
STRAIGHTENING EQUIPMENT

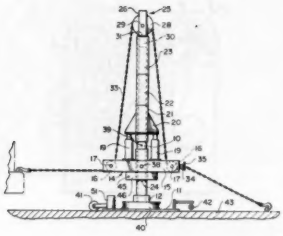
Antonius Albertus Roes, P.O. Box 75, Maitland, Ontario, Canada (K0E 1P0)

Filed Aug. 6, 1973, Ser. No. 385,680

Claims priority, application United Kingdom, Aug. 8, 1972, 37013/72; Nov. 16, 1972, 53035/72

Int. Cl.[2] B21D *3/14*

U.S. Cl. 72—457 **5 Claims**



1. Tensioning apparatus for applying tension to an object, said apparatus comprising:

a post;

means for movably supporting said post in an upright position;

means for vertically displaceably mounting a rotatable guide member on the top of said post;

a first rotatable guide member rotatably mounted in said rotatable guide member mounting means;

rotatable guide member support means extending transversely of said post;

second and third rotatable guide members rotatably mounted in said rotatable guide member support means at opposite sides of said post;

means for supporting said rotatable guide member support means at any one of a plurality of different positions spaced apart along said post;

a plurality of sleeve members extending around said post and disposed in end-to-end relationship along said post, said sleeve members being slidable along said post;

means for supporting said rotatable guide member mounting means on the uppermost one of said sleeve member; abutment means projecting laterally from the lowermost one of said sleeve members at opposite sides of said posts for transmitting vertically upwardly directed force to said sleeve members;

a pair of hydrauilc jacks disposed at opposite sides of said post between said abutment means and said rotatable guide member support means, said hydraulic jacks being extensible to apply said vertically upwardly directed force to said sleeve members and thereby raise said first rotatable guide member;

a chain extending over said first rotatable guide members and beneath said second and third rotatable guide member;

means for securing said chain at one side of said post to the object;

means for anchoring said chain at the opposite side of said post; and

means for locking said chain against movement at said opposite side of said post towards one of said second and third rotatable guide members, whereby said chain can be tensioned by the extension of said hydraulic jacks.

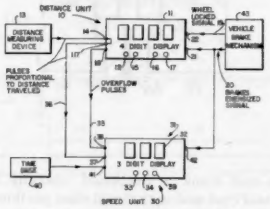
3,893,330
SURFACE FRICTION TESTING

George A. Shute, and Richard A. Zimmer, both of College Station, Tex., assignors to Data Systems, Inc.

Continuation-in-part of Ser. No. 316,369, Dec. 18, 1972, abandoned. This application Jan. 7, 1974, Ser. No. 431,358

Int. Cl. G01n *19/02*

U.S. Cl. 73—9 **14 Claims**



1. An apparatus for measuring speed and distance in testing to determine the skidding coefficient of friction between a road surface and a tire of a vehicle wheel to which a braking force is applied causing the wheel to lock, comprising:

speed measuring means for measuring the speed of said vehicle at the time a braking force is applied to the vehicle wheel; and

distance measuring means operably connected to said speed measuring means for measuring the distance travelled by said vehicle after said wheel has locked, whereby the vehicle speed at the time of braking and the distance travelled by said vehicle from the time said vehicle wheel locks until the vehicle comes to rest are determined.

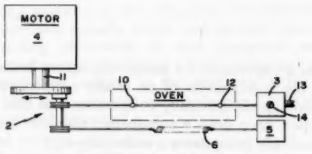
3,893,331
METHOD AND APPARATUS FOR DETERMINING SIDEWALL TEMPERATURE IN RUNNING TIRES

Dusan Ciril Prevorsek; Young Doo Kwon, both of Morristown; Russell Howard Butler, Dover, and Raj Kumar Sharma, Morristown, all of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Apr. 26, 1973, Ser. No. 354,566

Int. Cl. G01k *3/06*

U.S. Cl. 73—15.6 **4 Claims**



1. Non-destructive method of determining temperature profile through the sidewall of an inflated pneumatic tire running under load, which method comprises:

1. determining, for an inflated tire, the stress on the cords in the reinforced region of the sidewall when under no load;

2. determining, in the given tire sidewall, the following physical properties:

specific heat, cord (C_c)

specific heat, rubber (C_r)

density cord (D_c)

density rubber (D_r)

surface heat transfer coefficient from rubber to air (h)

thermal conductivity, cord (K_c)
thermal conductivity, rubber (K_r);

3. determining, in the given tire sidewall, the following parameters of construction:
thickness of the reinforced region (L_m)
thickness of the outer rubber layer (L_r)
volume fraction of cord in the reinforced region (V);
4. running such tire at constant rate of revolution while maintaining given ambient temperature and under at least one given load;
5. while so running the tire, measuring the surface temperatures at the sidewall after each new load is imposed, until the surface temperature reaches an equilibrium value;
6. determining values at various temperatures for rate of heat generation Q per unit volume of cords, by subjecting cords representative of those in said sidewall to hysteresis measurements at average stress maintained equal to that determined under no load per step 1 above; and at cycling rate equal to the rate of revolution imposed on the tire in step 4 above; and at a series of temperatures; and at various strain amplitudes; and measuring the area of the observed hysteresis loop to evaluate heat generation rate at various temperatures and at various strain amplitudes and given cycling rate;
7. solving by computer the relation below for temperature T at successive times t and at successive points x through the tire sidewall from the inside, through the reinforced region, through the outer rubber layer, to the outside at the surface point where surface temperature T_S was measured, viz.:

$DC\ (\delta T/\delta t) = K\ (\delta^2 T/\delta x^2) + QV$,

the symbols having the meanings shown in step 2, step 3 and step 6 above, D being the density and C the specific heat of cord or of rubber as appropriate; and the initial conditions being taken at all points x as:

$T(x,o) = T_a$ (the ambient temperature);

and the boundary conditions being taken as: at $x = 0$, $\delta T/\delta x = o$, where $x = o$ is at the inner boundary of the reinforced region; and at $x = L_m$, $K_m(\delta T/\delta x) = K_r\ (\delta T/\delta x)$, where (L_m) is at the outer boundary of the reinforced region and (K_m) is thermal conductivity of the reinforced region, and $K_m = K_c\ V + K_r\ (1-V)$; and at $x = L$, $-K_r\ (\delta T/\delta x) = h\ (T-T_a)$, where (L) is at the outer surface of the sidewall; and

8. correcting the values used for Q to arrive at a match between the calculated and the experimentally determined values of tire temperatures; whereupon the resulting values of T at the successive points x within the sidewall and at successive times represent the temperature profile through the sidewall at each time.

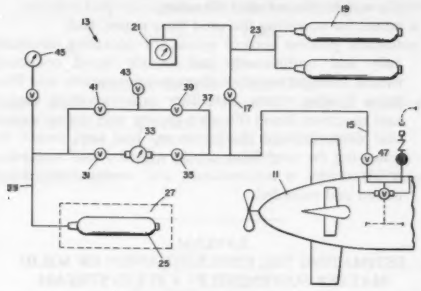
3,893,332

LEAKAGE TEST SYSTEM

Terry M. Dolan, Bremerton, and Michael G. Leedy, Poulsbo, both of Wash., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 21, 1974, Ser. No. 444,576
Int. Cl. G01m *3/26*
U.S. Cl. 73—40 **6 Claims**

1. A leakage test apparatus comprising:
a. first means for sampling and containing at a first predetermined pressure a gas contained in an enclosed volume at a first predetermined pressure;
b. second means for comparing the pressure of said gas contained in said first means with the pressure of the gas contained in said enclosed volume over a predetermined time duration;
c. third means for adding supplementary gas to the gas contained in said enclosed volume to maintain the pressure of the gas contained in said enclosed volume at said first predetermined pressure; and
d. fourth means for measuring the amount of supplementary



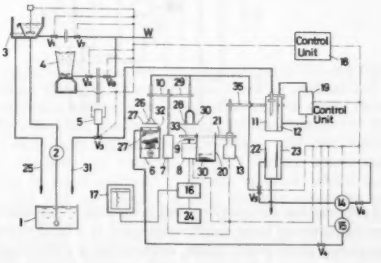
gas added to said enclosed volume during said predetermined time duration.

3,893,333

DEVICE FOR AUTOMATIC DETERMINATION OF SUSPENDED SOLIDS CONTENT IN WATER

Hiroshi Sunahara, Seto; Yutaka Ishihara, Anjo, and Noboru Nakayama, Nagoya, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Nov. 14, 1973, Ser. No. 415,799
Claims priority, application Japan, Nov. 15, 1972, 47-114441
Int. Cl. G01n *11/02*
U.S. Cl. 73—61 R **9 Claims**



1. A device for the determination of suspended solids content in water, comprising in combination:
a sample liquid collection means adapted to collect a sample liquid continuously,
a specimen liquid preparation means adapted to agitate the collected sample liquid and meter out a predetermined amount of the prepared specimen liquid;
a filter paper feeding means adapted to take out individual sheets of filter paper one by one and deliver the sheet of filter paper onto a turntable disposed over a weighing plate,
a filter paper weighing means serving to weigh the filter paper placed on the turntable and register the weight thereof,
a specimen liquid filtration means adapted to deliver the predetermined amount of specimen liquid received from the specimen liquid preparation means onto the filter paper of known weight and cause suspended solids to be separated from the specimen liquid in consequence of filtration through the filter paper,
a drying means for drying the filter paper on which the suspended solids separated from the liquid are deposited,
a determination display means adapted to transfer the

dried filter paper to be weighed onto said filter paper weighing means and display and record the difference between the weight of filter paper prior to filtration and the weight thereof after filtration,

a means for removing the used filter paper, and

automatic process control means for operating automatically and continuously said sample liquid collection means, said specimen liquid preparation means, said filter paper feeding means, said filter paper weighing means, said specimen liquid filtration means, said drying means, said determination display means and said means for removing the used filter paper, whereby said suspended solid content is automatically and continuously determined and recorded.

3,893,334

ESTIMATING THE CONCENTRATION OF SOLID MATTER SUSPENDED IN A FLUID STREAM

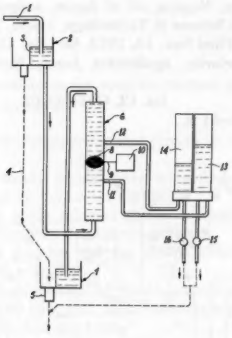
David Joseph Williams, East Ivanhoe, Australia, assignor to Australian Paper Manufactures Limited, South Melbourne, Australia

Filed Jan. 16, 1974, Ser. No. 433,934

Claims priority, application Australia, Jan. 24, 1973, 2010/73

Int. Cl.[2] G01N *15/06*

U.S. Cl. 73—61 R **7 Claims**



1. Apparatus for carrying out a method of estimating the concentration of large solids suspended in a fluid stream also containing small-grain solids, comprising a cylindrical flow-chamber, a conduit for continuously removing part of the fluid stream for measurement, a first constant-head device for supplying at least some of said part to one end of the chamber, a second constant-head device for removing fluid from the other end of the chamber, a sieve movable in an intermediate part of the chamber so as selectively to catch solids from the substantially uniform flow that is due to a pressure drop between the constant-head devices, manometer means for continuously sensing the pressure difference between upstream and downstream of the sieve, and means for deriving therefrom a measure of the relevant solids concentration.

3,893,335

DEVICE FOR SIMULATING REENTRY CONDITIONS IN A PARTICLE LADEN ATMOSPHERE

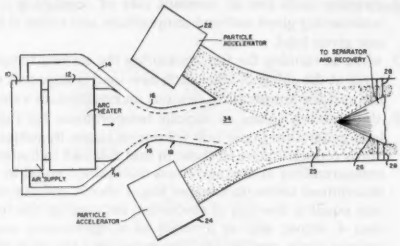
Elmer G. Johnson, Fairborn, and Hans J. P. Von Ohain, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 13, 1974, Ser. No. 442,300

Int. Cl. G01m *9/00*

U.S. Cl. 73—147 **2 Claims**

1. An apparatus for providing a particle laden air stream simulating the reentry conditions encountered by a ballistic missile, comprising: an expansion nozzle; means for providing an air stream at a speed of between 10,000 and 12,000 ft/sec; said means for providing an air stream at a speed of between 10,000 and 12,000 ft/sec. including an arc heater, means for supplying high pressure air to said arc heater and an expansion nozzle connected to the output of said arc heater; means for



accelerating solid particles, of a predetermined material and size, to a velocity between 10,000 and 20,000 ft/sec; means for introducing said particles into said arc heated air near the output end of the expansion nozzle to thereby provide high speed particle laden air stream; means for supporting a test device in the particle laden air stream in close proximity to the position where the particles are introduced.

3,893,336

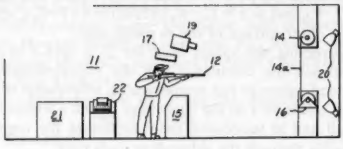
METHOD AND APPARATUS FOR AUTOMATICALLY EVALUATING ACCURACY AND PATTERN DENSITY FOR A SHOTGUN

Henry G. Tucker, Norwalk, Conn., assignor to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Mar. 5, 1973, Ser. No. 337,881

Int. Cl. F41c *31/04*

U.S. Cl. 73—167 **8 Claims**



1. A method of evaluating a shotgun, said method comprising the steps of aiming a shotgun at a predetermined aiming spot on an opaque target having a center point, firing the shotgun to produce a plurality of randomly distributed holes in the target, illuminating the target to cause light to pass through the holes in the target, and activating optical scanning means responsive to light passing through said holes for automatically scanning the target to generate two dimensional positional data locating each hole in the target.

3,893,337

ANGULAR DIRECTION RECORDERS

John Ivor Parry Jones, Winterslow, near Salisbury, England, assignor to British Secretary of State for Defence, London, England

Filed July 16, 1973, Ser. No. 379,663

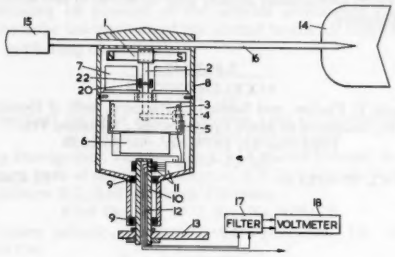
Claims priority, application United Kingdom, July 19, 1972, 33662/72

Int. Cl. G01w *1/00*

U.S. Cl. 73—188 **8 Claims**

1. An angular direction sensing device having rotatably mounted on a support member a circular motion potentiometer having electrical power supply connections and input and output connections thereto and a plurality of tapping points,

a magnet rotatably mounted so that it can align itself substantially freely with the earth's magnetic field, a rotor driven by rotation of the magnet and operable to connect said tapping points in accordance with its angular position to an output electrical connection, whereby the angular position of the rotor in relation to a given tapping point of the potentiometer, and hence any electrical output signal thereof, is proportional



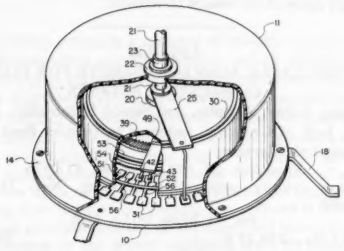
to the angle between said given tapping point and the magnet independent of the orientation of said support member, said device having a fin rotatably mounted so that it can align itself with an ambient fluid flow, and means for rotating the potentiometer tapping points with said fin so that the tapping points are rotated relative to the rotor in accordance with the angular position of said fin.

3,893,338

SELF-ORIENTING POTENTIOMETER

Grady O. Floyd, Saugus, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 26, 1974, Ser. No. 500,836
Int. Cl. G01w *1/00;* **G01p** *13/02*
U.S. Cl. 73—188 **10 Claims**



1. A potentiometer capable of self-orientation with respect to a predetermined reference comprising:

a plate having an upper surface and a lower surface;

an endless loop of resistive material mounted on said upper surface of said plate;

a first arm including two contacts mounted at one end thereon, said first arm being rotatably mounted on said plate;

means, mounted on said first arm, for aligning said first arm with a predetermined reference;

means mounted on said plate for fixedly positioning said two contacts into conductive contact with said resistive loop;

means connected to each of said contacts for applying a potential across said two contacts, said potential being of sufficient value to remove the smaller portion of said resistive loop conductively connected between said two contacts; and

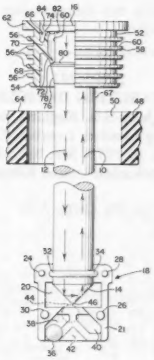
a second arm including a third contact at one end thereon, said second arm being rotatably mounted on said plate so that said single contact is in conductive contact with said resistive loop throughout the rotation of said second arm.

3,893,339

LIQUID LEVEL INDICATOR

Robert Richard Melone, Des Plaines, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Mar. 18, 1974, Ser. No. 452,086
Int. Cl. G01f *23/02*
U.S. Cl. 73—327 **10 Claims**



1. A liquid indicator comprising an elongated rod of a light transmitting material having an upper viewing surface and a lower reflective surface, a projecting disc near its upper viewing surface having a diameter greater than the diameter of the rod, an outwardly inclined surface below said disc which extends upwardly, an inwardly inclined surface above said outwardly inclined surface, a closure member which surrounds said rod, an annular sealing element extending inwardly towards said rod from the inner periphery of said closure member comprising a relatively rigid downwardly extending sealing member and a relatively flexible upwardly extending sealing member constructed so that said closure member is held in sealing engagement with said rod when said closure member is forced upwardly from the bottom of the said rod to the point where said rigid sealing member abuts against said inwardly inclined surface in sealing relationship and said flexible sealing member is deflected inwardly by the lower surface of said disc so as to form a seal between said lower surface, said disc, and the outer periphery of said rod.

3,893,340

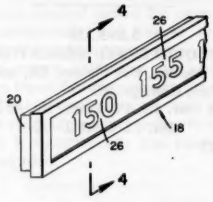
THERMALLY INSULATED THERMOMETER

Robert Parker, Danville, Calif., assignor to RPR, Inc., Dublin, Calif.

Filed June 27, 1973, Ser. No. 374,214
Int. Cl. G01k *11/12, 11/20*
U.S. Cl. 73—356 **17 Claims**

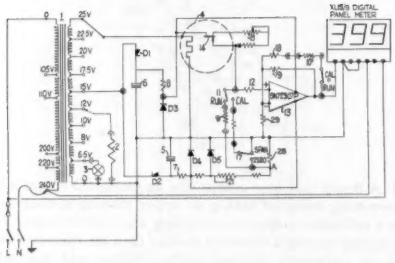
1. Apparatus for measuring relatively extreme temperatures comprising an insulator having a first surface for attachment to an object the temperature of which is to be measured and a second surface opposite and spaced apart from the first surface, the insulator having a known and constant thermal conductivity coefficient and a constant still convection coefficient so that the temperature at the second surface is a linear

function of the temperature of the object, liquid crystal a thermometer thermally coupled to the second surface, and



means cooperating with the thermometer for indicating the temperature of the object.

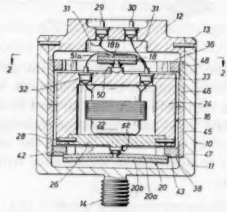
3,893,341
MEASURING DEVICES
Alan Birt Acres, Leigh-on-Sea, England, assignor to Electrothermal Engineering Limited, London, England
Filed Jan. 5, 1973, Ser. No. 321,119
Claims priority, application United Kingdom, Jan. 6, 1972, 682/72
Int. Cl. G01k *7/20*
U.S. Cl. 73—362 AR **10 Claims**



1. Melting point determination apparatus comprising a heatable sample holder for supporting and heating a sample of material whose melting point is to be determined, first and second similar metallic temperature dependent resistances positioned so that their temperature remains close to that of said sample holder, an amplifier having a negative feedback path between its output and its input, said first resistance being arranged in said feedback path for varying the gain of said amplifier by varying the amount of feedback supplied by said feedback path in accordance with said temperature, a constant current source connected to said second resistance for supplying current which passes through the second resistance to form across the terminals thereof a voltage signal whose value depends on said temperature, the input of the amplifier being connected to the second resistance for amplifying said voltage signal to form an output signal which varies substantially linearly with variations in said temperature, and means, connected to the amplifier output, for indicating said temperature, the apparatus further including a projection lamp and a lens system for projecting an observable image of said sample, when the latter is present, onto a screen.

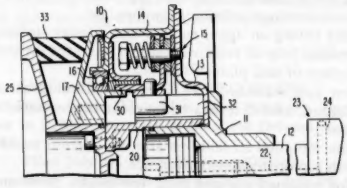
9. A measuring device comprising an amplifier, a negative feedback path between its output and its input, a first metallic temperature dependent resistance for being subjected to an ambient temperature to be measured for its resistance value to depend on said ambient temperature and arranged in said feedback path for varying the amount of feedback supplied by said feedback path in accordance with said physical condition, a constant current source, a reference voltage point, and a second metallic temperature dependent resistance for being subjected to said ambient temperature for its resistance value to depend on said ambient temperature, the second resistance having one terminal connected to said constant current source and to the input of the amplifier and its other terminal connected to said reference voltage point, for supplying to the input of the amplifier an electrical input signal indicative of said ambient temperature, whereby the output of said amplifier varies substantially linearly with variations in said ambient temperature.

3,893,342
ACCELEROMETER
Eugene F. Florian, and Samuel E. Haggard, both of Houston, Tex., assignors to Mark Products, Inc., Houston, Tex.
Filed May 21, 1973, Ser. No. 362,538
Int. Cl. G01p *15/08*
U.S. Cl. 73—517 R **12 Claims**



1. An accelerometer comprising a housing, two beams located in the housing, means in the housing supporting the beams in spaced generally parallel planes, each beam comprising a first layer of material of relatively high tensile strength and a second layer of piezoelectric material, and a mass located between the beams and supported thereby, said beams being bent by the mass to place the piezoelectric material layer of the beams in compression and the high tensile strength layer of the beams in tension.

3,893,343
CONTROLLABLE AGGREGATE-DRIVE FOR INTERNAL COMBUSTION ENGINES
Wolfgang Zaiser, Althutte, and Sigurd Hainmuller, Aichschiess, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany
Filed Nov. 20, 1973, Ser. No. 417,576
Claims priority, application Germany, Nov. 21, 1972, 2256989
Int. Cl. F16h *55/52, 5/48*
U.S. Cl. 74—230.17 F **30 Claims**



1. A controllable aggregate drive for internal combustion engines having a crankshaft, which comprises a controllable V-belt transmission means for driving at least one auxiliary aggregate from said crankshaft including a driving pulley means having a movable pulley member, and means controlling the transmission ratio of said V-belt transmission means

in such a manner that at low rotational speeds of the crankshaft a transmission with a speed increase results and with increasing rotational speeds of the crankshaft the speed increase transmission ratio is automatically reduced, including a piston means acted upon by a pressure medium, said piston means being operatively connected with the driving pulley means of the V-belt transmission means and displacing against spring action the movable pulley member thereof, characterized in that the piston means is acted upon directly by the lubricating oil pressure of the internal combustion engine without the interposition of any control means for controlling the lubricating oil pressure.

3,893,344

CONTROL DEVICE FOR A MOTOR AND AN INFINITELY VARIABLE CONE-PULLEY GEAR

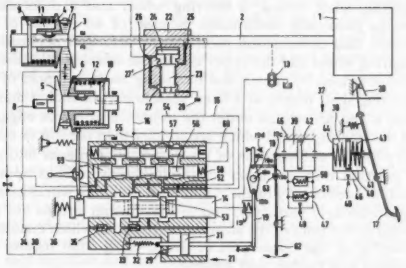
Jorg Dantlgraber, Bad Homburg, and Rudolf Schrodt, Kronberg, both of Germany, assignors to P.I.V. Antrieb Werner Reimers KG, Bad Homburg, Germany

Filed Dec. 20, 1973, Ser. No. 426,575

Claims priority, application Germany, Jan. 15, 1973, 2301776

Int. Cl. F16h *55/22*

U.S. Cl. 74—230.17 F **14 Claims**



1. In a drive comprising a motor of variable power output and load-dependent speed of rotation and an infinitely variable cone-pulley transmission driven by said motor, and fluid-pressure means supplying fluid to the transmission for controlling the sides of the transmission to adjust the transmission ratio, a control slide for adjustment of the pressure of the fluid, a motor regulating lever and a centrifugal governor rotating proportionally with the speed of rotation of an element of the drive, and including means at each setting of the regulating lever to provide a specific motor speed at which the centrifugal governor is in the steady state, and means to transmit the motion of the motor regulating lever to the control slide, said transmitting means including delay means for retarding the movement of the control slide by the movement of the regulating lever, said delay means including means to delay the movement of the control slide in inverse proportion to the speed of movement of the regulating lever.

3,893,345

TRANSMISSIONS

Ronald L. Sisson; Philip J. Dreves; James E. Shellberg, all of Jackson, and Burton S. Zeller, Parma, all of Mich., assignors to Clark Equipment Company, Buchanan, Mich.

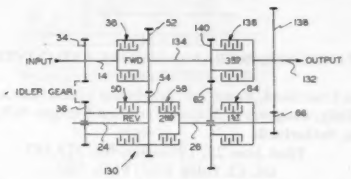
Continuation of Ser. No. 392,140, Aug. 27, 1973, abandoned. This application Sept. 9, 1974, Ser. No. 504,576

Int. Cl. F16h *3/08*

U.S. Cl. 74—331 **24 Claims**

1. In a multispeed constant-mesh-gear transmission of the type having a plurality of shafts, gears and bidirectionally engageable clutches, the combination comprising:

a. an input shaft;
b. a first gear fixed to said input shaft;
c. a first shaft lying in a common plane with and capable of bidirectional rotation with respect to said input shaft;
d. a second gear mounted on and capable of being rotated with respect to said first shaft and drivingly connected with said first gear so as to rotate in the same direction therewith;
e. a second shaft axially aligned with and capable of bidirectional rotation with respect to said input shaft;
f. first clutch means for connecting said input shaft with said second shaft;
g. second clutch means for connecting said second gear to said first shaft for conjoint rotation therewith;
h. a third gear fixed to said second shaft;
i. a fourth gear fixed to said first shaft and in mesh with said third gear;



j. a third shaft axially aligned with one of said first and second shafts and capable of bidirectional rotation with respect to said input shaft;
k. third clutch means for connecting said third shaft with one of said first and second shafts;
l. a fifth gear mounted on and capable of being rotated with respect to said third shaft;
m. fourth clutch means for connecting said fifth gear to said third shaft;
n. a sixth gear fixed to said third shaft, said fifth gear being located intermediate said third clutch means and said sixth gear;
o. an output shaft capable of bidirectional rotation with respect to said input shaft; and
p. means for drivingly connecting said output shaft with at least said sixth gear, with all of said shafts lying in a common plane.

3,893,346

ARTICULATELY MOUNTED FLUID CONTROLS

David S. Paul, Mississauga, Canada, assignor to Massey-Ferguson Inc., Detroit, Mich.

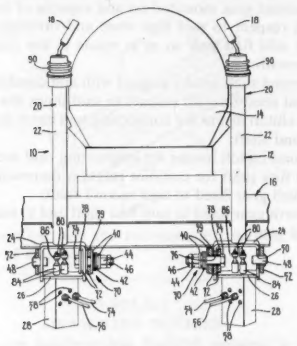
Filed Jan. 4, 1974, Ser. No. 430,831

Int. Cl. G05g *9/04*

U.S. Cl. 74—471 R **10 Claims**

1. A control for a fluid control system providing power to controlled components comprising, a lever, a pivotal connection for mounting said lever on and pivoting said lever with respect to said system in at least one direction, a control valve mounted on one end of said lever, said control valve movable with said one end, means for actuating said control valve mounted on the opposite end of said lever from said control

valve, and conduit means interconnecting said control valve with the controlled components to permit operation of the



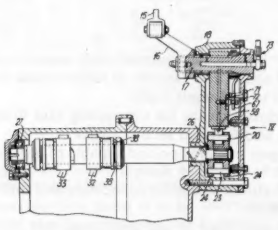
controlled components by said means for actuating in a range of positions through which said lever pivots.

3,893,347

CHANGE SPEED TRANSMISSIONS AND CONTROLS THEREFOR

Bruno Fracchioni, Rome, and Guglielmo Villani, Lavinio, both of Italy, assignors to Massey-Ferguson Services N.V., Curacao, Netherlands

Filed June 25, 1973, Ser. No. 373,537
Int. Cl. G05g 9/02; F16h 5/08
U.S. Cl. 74—473 R **4 Claims**



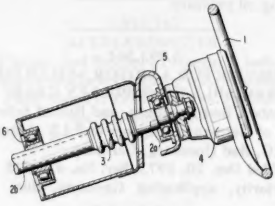
1. A change speed transmission providing a finite plurality of speed ratios, said transmission comprising drive means adapted to drivingly engage said speed ratios, a rotatable shaft with a surface, said drive means slidable on said shaft, cam means including two cam tracks on the surface of said shaft between said shaft and said drive means to engage selectively said drive means, indexing means operable and mounted on said shaft to move said cam means, one of said cam tracks comprising a zigzag form and the other of said cam tracks comprising two substantially parallel linear portions interconnected by a linear and curved portion, and in which a first drive means is associated with said one cam track and a second drive means is associated with said other cam track, the arrangement being such that rotation of said shaft firstly axially moves said first drive means in a first axial direction and maintains said second drive means axially stationary, secondly reverses the direction of movement of said first drive means and, moves said second drive means in an axial direction, and thirdly moves said first drive means axially in said first direction and maintains said second drive means axially stationary, and a manually operable control for indexing movement of said indexing means by successive movement for selection of alternate ratios which are zero speed ratios.

3,893,348

SAFETY STEERING FOR MOTOR VEHICLES

Egon Rieth, Boblingen, and Bela Barenyi, Maichingen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Apr. 2, 1974, Ser. No. 457,381
Claims priority, application Germany, Apr. 3, 1973, 2316515
Int. Cl. B62d 1/18
U.S. Cl. 74—492 **19 Claims**



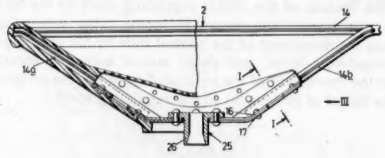
1. A safety steering for motor vehicles which includes a steering shaft means, a steering wheel and a deformation means plastically deformable in case of an impact of the driver, said deformation means being arranged between the steering wheel and the upper end of the steering shaft means, characterized by means for mounting an upper part of the steering shaft means at a fixed vehicle part in such a manner that it can be pivoted under the influence of forces engaging at the steering wheel which are smaller than the forces necessary for the deformation of the deformation means into such a position that its center longitudinal axis extends approximately horizontally or the plane of the steering wheel extends approximately vertically, and in that further means are provided in the train of the steering shaft means which enable the pivoting of the upper part of the steering shaft means with respect to a further part thereof.

3,893,349

STEERING WHEEL FOR VEHICLES

Vernon Denis Stent, Guildford, England, assignor to Creators Limited, England

Filed Feb. 20, 1974, Ser. No. 444,251
Claims priority, application United Kingdom, Feb. 21, 1973, 8395/73
Int. Cl. B62d 1/04
U.S. Cl. 74—552 **7 Claims**

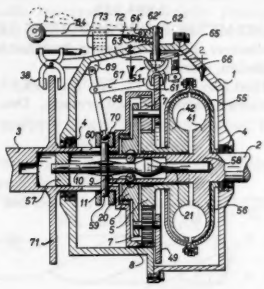


1. A steering wheel for a vehicle and comprising a rim connected to a hub by spokes, wherein the rim comprises a plurality of separately made metallic sections each of which is bent inwards towards the hub to provide spoke parts, characterized in that the hub is metal and includes oppositely extending radial arms each provided with longitudinally extending flanges which are bent over in opposite directions to grip the inner ends of the spoke parts of each section.

3,893,350
VARIABLE RATIO TRANSMISSION WITH REVERSE DRIVE

Claude A. Gingras, Dosquet, Canada

Filed June 3, 1974, Ser. No. 476,060
Int. Cl. F16h 47/08
U.S. Cl. 74—688 2 Claims



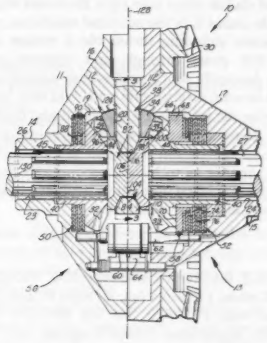
1. A variable ratio transmission with reverse drive comprising an input shaft means, an output shaft means, a planetary gear set including a ring gear secured to said output shaft means, a sun gear, a freely rotatable planet carrier and planet gears freely rotatable on said planet carrier and intermeshing with said sun gear and said ring gear, means to releasably brake said planet carrier against rotation, means to releasably lock said planet carrier to said input shaft means, control means to effect release of said locking means and braking of said braking means, and vice versa, and a fluid coupling including an impeller member secured to said input shaft means and a turbine member secured to said sun gear, whereby acceleration of said input shaft means causes progressive coupling of said sun gear to said input shaft means, said input and output shaft means being coaxially mounted, together with said impeller and turbine members of said fluid coupling, said input and output shaft means having communicating adjacent hollow portions and said locking means include a rod located within and axially movable relative to said input and output shaft means hollow portions, a cross pin secured to said rod and extending through elongated slots made in the hollow portion of said output shaft means, a sliding ring surrounding said output shaft means and connected to said cross pin, and locking members rotatably carried by said input shaft portion and radially movable into locking arrangement with said planet carrier upon axial movement of said rod in one axial direction.

3,893,351
LIMITED SLIP DIFFERENTIAL DRIVE MECHANISM

Jerry F. Baremor, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed June 19, 1973, Ser. No. 371,479
Int. Cl. F16h 1/44
U.S. Cl. 74—710.5 5 Claims

1. A differential drive assembly comprising a rotatable input member, a rotatable output member, differential gear means for drivingly connecting said input member with said output member and for enabling relative rotation to occur between said input and output members, said differential gear means including first and second axially movable side gears rotatable about their respective central axes and a pinion gear disposed in meshing engagement with said side gears, clutch means operable between an actuated condition in which said clutch means is effective to retard relative rotation between said input and output members and an unactuated condition in which said clutch means is ineffective to retard relative rotation between said input and output members, said clutch means including a first group of clutch discs disposed adjacent to said first side gear, a second group of clutch discs disposed adjacent to said second side bear, and means for applying force to said first side gear and said first group of clutch discs to press said first group of clutch discs into tight frictional engagement when said clutch means is in the actuated condition, force transmitting means for pressing said second group of clutch discs into tight frictional engagement when said clutch means is in the actuated condition, said force transmitting means including thrust block means spaced radially inward with respect to said side gear axes from said pinion gear and being free to rotate about said side gear axes independent of said pinion gear wherein said pinion gear and said first side gear mesh in such a manner as to have a first amount of backlash therebetween, and said pinion gear and said second side gear mesh in such a manner as to have a second amount of



backlash therebetween, said first amount of backlash being greater than said second amount of backlash.

4. A differential drive assembly comprising a rotatable input member, a rotatable output member, differential gear means for drivingly connecting said input member with said output member and for enabling relative rotation to occur between said input and output members, said differential gear means including first and second side gears rotatable about their central axes and a rotatable pinion gear disposed in meshing engagement with said side gears, clutch means operable between an actuated condition in which said clutch means is effective to retard relative rotation between said input and output members and an unactuated condition in which said clutch means is ineffective to retard relative rotation between said input and output members, said clutch means including means for applying force to said first side gear when said clutch means is in the actuated condition, and force transmitting means for transmitting force from said first side gear to said second side gear independently of said pinion gear when said clutch means is in the actuated condition, said force transmitting means including a first thrust block disposed in radially and rotationally sliding abutting engagement with said first side gear and second thrust block disposed in radially and rotationally sliding abutting engagement with said second side gear and said first thrust block both of said thrust blocks being spaced radially inward with respect to said side gear axes from said pinion gear and being free to rotate about said side gear axes independent of said pinion gear.

5. A differential drive assembly comprising a rotatable input member, a rotatable output member, differential gear means for drivingly connecting said input member with said output member and for enabling relative rotation to occur between said input and output members, said differential gear means including first and second axially movable side bears rotatable about their central axes, spider means for positioning a plural-

ity of pinion gears, and a plurality of pinion gears rotatably disposed on said spider means in meshing engagement with said side gears, said spider means including means for defining an opening having a central axis disposed in a coaxial relationship with the central axes of said side gears, clutch means operable between an actuated condition in which said clutch means is effective to retard relative rotation between said input and output members and an unactuated condition in which said clutch means is ineffective to retard relative rotation between said input and output members, said clutch means including a first group of clutch discs disposed adjacent to and in a coaxial relationship with said first side gear, a second group of clutch discs disposed adjacent to and in a coaxial relationship with said second side gear, and means for applying force to said first side gear and said first group of clutch discs to press said first group of clutch discs into tight frictional engagement when said clutch means is in the actuated condition, and force transmitting means for pressing said second group of clutch discs into tight frictional engagement when said clutch means is in the actuated condition, said force transmitting means including thrust block means extending between said side gears through said opening and being spaced radially inwardly along said spider central axis from said spider in a coaxial relationship with said first and second side gears and wherein said pinion gears and said first side gear mesh in such a manner as to have a first amount of backlash therebetween, and said pinion gears and said second side gear mesh in such a manner as to have a second amount of backlash therebetween, said first amount of backlash being greater than said second amount of backlash.

3,893,352

VARIABLE RATIO TRANSMISSION TRAINS

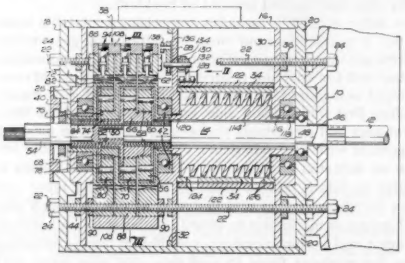
George Albert Cotton, 1 Machpelah, Hebden Bridge, England

Filed Sept. 27, 1973, Ser. No. 401,451

Claims priority, application United Kingdom, Oct. 27, 1972, 49624/72

Int. Cl. F16h *3/44*

U.S. Cl. 74—768 **5 Claims**



1. A variable ratio transmission gear comprising an input shaft, a first planetary gearset having a first member mounted coaxially of the input shaft and driveably connected to said input shaft, a second planetary gearset mounted coaxially with the first planetary gearset and having a first member driveably connected to a second member of the first planetary gearset, an output shaft co-axial with said input shaft and driveably connected to said second member of the second planetary gearset, a variable resistance hydraulic fluid worm pump carried on and coaxial with the input shaft driveably connected to a third member of the first planetary gearset, a stationary tube defining a chamber within which the worm of said pump rotates and a rotatable tube surrounding the stationary tube, ports in the tubes adapted to be brought into selective registry by rotation of said rotatable tube whereby rotation of the rotatable tube may selectively vary the effective overlapping areas of the ports from an open neutral position to a constant flow restricting driving position, and engaging means for preventing rotation of a third member of the second planetary gearset whereby when the rotatable tube is in said driving position and the third member of the second planetary gearset is engaged by said engaging means drive power is transmitted from said input shaft to said output shaft when the input shaft is rotated.

3,893,353

DRILL AND METHOD OF PRODUCING THE SAME

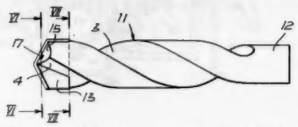
Hermann Lahmeyer, Bollen, Germany, assignor to Gebrueder Heller, Uphusen, Germany

Filed Nov. 17, 1971, Ser. No. 199,574

Claims priority, application Germany, Dec. 28, 1970, 2064024

Int. Cl. B21r *5/04*

U.S. Cl. 76—108 T **11 Claims**



1. A method of producing a drill having a shank with a first longitudinal axis, a cutting end, a single channel coaxially extending along said first longitudinal axis, and at least one chip-removing flute extending from said cutting end in the outside surface and at least along a portion of the length of said shank, comprising the steps of supporting a tubular blank having a substantially cylindrical wall surrounding a bore of a substantially circular cross section which is coaxial with said blank, filling out said bore with a gaseous filling material, impressing said chip-removing flute into said blank by structurally deforming the material of said wall along at least a portion of the length of said blank by rolling said portion of said blank between two rollers, shifting one of said rollers in the direction toward the other of said rollers so that said portion of said blank is pressed to form said shank with said chip-removing flute thereby increasing at least one outer dimension of said portion by at least a part of the material being displaced by impressing said flute, thereby also deforming said bore in said portion so that said coaxial channel in said portion has elongated cross sections of substantially identical areas substantially coaxial with said first longitudinal axis, and cutting said deformed portion of said blank to form said cutting end.

3,893,354

TORQUE LIMIT WRENCH

William A. Knoll, Santa Ana, Calif., assignor to JO-Line Tools, Inc., Anaheim, Calif.

Filed Sept. 30, 1974, Ser. No. 510,578

Int. Cl. B25b

U.S. Cl. 81—52.4 R **11 Claims**

1. A torque limit wrench for applying a predetermined torque to a work piece and comprising:

work-receiving head means;

handle means;

pivot means coupling said handle to said head;

a latch for latching said pivot means against pivoting; and

limit means connected with said latch and operative in response to application of a sufficient force to said handle to apply said predetermined torque to said head to release

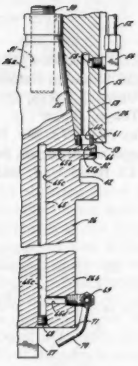
said latch to free said handle for pivoting to render said handle inoperative for applying torque higher than said predetermined torque to said head whereby said head may be received over a work piece, a rotary force applied to said handle to apply said predetermined torque to said work piece and upon application of a rotary force sufficient to apply said predetermined torque to said work piece said limit means will release said latch to render said handle inoperative to thereby positively prevent application of a torque higher than said predetermined force to said work piece.

3,893,355

COOLANT SUPPLY SYSTEM FOR CUTTING TOOLS IN A MACHINE TOOL

Charles R. Maastricht, Fond du Lac, Wis., assignor to Giddings & Lewis, Inc., Fond du Lac, Wis.

Filed Dec. 21, 1973, Ser. No. 427,321
Int. Cl. B23b *21/00*
U.S. Cl. 82—24 **13 Claims**



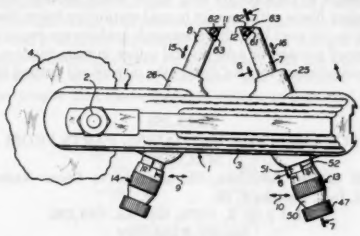
1. In a machine tool having a tool support with a socket in one end thereof for removably receiving and supporting a cutting tool adapter having a shank shaped complementary to said socket and an outwardly extending radial flange with a surface perpendicular to the longitudinal axis of said tool adapter, said socket and shank each having bearing surfaces that are mutually engageable when said tool adapter is secured in said support for a machining operation, a cutting tool coolant supply system comprising a coolant reservoir, said support being formed with a longitudinal internal passage having an inlet and an outlet, means connecting said passage inlet to said coolant reservoir, said passage outlet being located in the end of said support at a laterally offset position from said socket, said tool adapter being formed with an internal passage having an inlet on said radial flange surface at a position aligned with said support passage when said tool adapter is secured in said support, said tool adapter passage extending from said radial flange inlet to an outlet in close proximity to the cutting tool of said adapter, means for selectively supplying coolant from said coolant reservoir through said support and tool adapter passage during a machine operation, and means for directing the flow of coolant from said adapter passage outlet onto the cutting tool of said adapter.

3,893,356

ROTOR CUTTER

Frank Atzberger, 97-26 Sutphin Blvd., Jamaica 35, N.Y.

Filed Mar. 19, 1974, Ser. No. 452,544
Int. Cl. B23b *29/26*
U.S. Cl. 82—36 R **2 Claims**



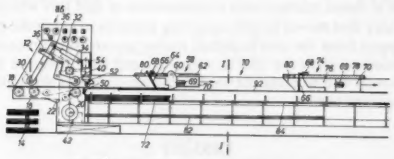
1. A rotor cutter, comprising
a housing adapted to be pivotally connected to a drum lathe machine,
two cutter arms, operatively slidably mounted, at fixed angular orientations, relative to and on said housing,
further comprising
micrometer means for effecting a fine displacement of said cutter arms in a direction along said fixed angular orientations,
means for sliding said cutter arms relative to a longitudinal direction of said housing for effecting a coarse displacement of said cutter arms,
still further comprising
slides slidably mounted on said housing for movement towards and away, respectively, from one another,
said cutter arms being disposed in said slides, and
said micrometer means comprising
a micrometer screw threaded in said slides and rotatably yet displaceably immovably connected to said cutter arms.

3,893,357

PROCESS FOR CUTTING REINFORCING STEEL BARS FOR STEEL CONCRETE AND A BAR CUTTING MACHINE FOR EFFECTING THE PROCESS

Helmut Zahlaus, Calvinstrasse 3, D-3550 Marburg, Germany

Filed July 18, 1973, Ser. No. 380,524
Claims priority, application Germany, July 18, 1972, 2235120; June 15, 1973, 2330496
Int. Cl. B23d *23/00*
U.S. Cl. 83—80 **19 Claims**



1. In a steel bar cutting machine for cutting reinforcing steel bars for concrete steel including a conveying and carrying frame, secured to a base frame which is made of structural steel and is laterally displaceable and further including a conveying and cutting unit and a longitudinally displaceable measuring device, the improvements comprising:

a. a conveying and cutting unit (**12**) which is built over the base frame, having driven conveyor rollers (**18, 20**) at its lower part and pressure loaded pressure rollers (**30, 40**) at its upper part, one of said pressure rollers (**30**) being adapted to be released and adjusted automatically and in

synchronism with the cutting operation of a vertically guided blade;

b. a vertically reciprocable blade support having an upper cutting blade pivotally attached thereto;

c. a stationary lower cutting blade attached to said conveying and cutting unit; and

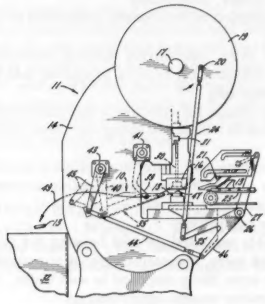
d. means to reciprocate said upper blade support and said upper blade with respect to said stationary lower blade so as to cut steel bars therebetween, said means engaging an upper portion of said pivotal upper cutting blade to prevent pivoting thereof during the downward cutting stroke.

3,893,358

MECHANISM FOR UNLOADING PARTS FROM A MACHINE

Paul H. Dixon, Belvidere, Ill., assignor to Dixon Automatic Tool, Inc., Rockford, Ill.

Filed Aug. 2, 1974, Ser. No. 494,081
Int. Cl. B26d *7/06*
U.S. Cl. 83—82 **3 Claims**



1. A mechanism for unloading a part from a machine having a movable tool and having a drive for reciprocating the tool through upward and downward strokes, the part being carried upwardly with the tool as the latter moves upwardly and then dropping downwardly from the tool, said mechanism comprising a downwardly inclined tray, means mounting said tray on said machine for movement along an upwardly concave and generally arcuate path from a part-receiving position to a part-unloading position, said tray being located beneath said tool when in said receiving position and being located out of the path of the tool when in said unloading position, and means connecting said tray to said drive and operable to move said tray back and forth between said positions and along said path in timed relation with reciprocation of said tool whereby the tray first moves to said receiving position to catch the part dropped from the tool and then moves toward said unloading position to carry the part downwardly and then sling the part upwardly and to clear the tool as the latter moves through its downward stroke.

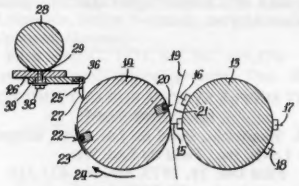
3,893,359

SCRAP STRIPPER FOR PRINTER

Clyde G. Gregoire, 4N194 Briar Ln., Bensenville, Ill. 60106

Filed May 22, 1974, Ser. No. 472,117
Int. Cl. B26d *7/18*
U.S. Cl. 83—154 **1 Claim**

1. A scrap paper retrieval and stripper from a printing press cutter of the type having a rotatable cutting roller and a cooperative rotatable anvil roller, comprising a pair of arcuately spaced apart paper cutting knives extending longitudinally on the circumference of said rotatable cutting roller, a plurality of longitudinally disposed in-line equally spaced apart radial pins projecting from the surface of the anvil roller and adapted to impale the paper at a position substantially midway between said arcuately spaced apart knives to thereby hold a severed piece of scrap paper from the cutting roller after the two knives have passed their cutting contact with the anvil roller, and a plurality of longitudinally disposed in-line equally spaced apart rigid tapered stationary stripping fingers located closely adjacent the surface of the anvil roller at a position remote from its cooperative engagement with the cutting roller, said longitudinally spaced apart pins intercalated relative to the longitudinal spaced apart tapered fingers, whereby upon rotation of the anvil roller the plurality of impaling pins pick up the freed scrap paper and carry it around to the stripping fingers for effecting a positive removal of the scrap paper from its impalement on the pins so that upon continued rotation of the rollers the operation may be repeated without any scrap paper interfering with a succeeding cutting and impaling operation.

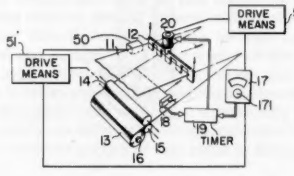


3,893,360

COPY STRIP FEED ERROR CORRECTING DEVICE

Takashi Yano; Yoichi Shibuya; Satoshi Kanda, all of Yokohama, and Shin Umeda, Tokyo, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed May 30, 1973, Ser. No. 365,215
Claims priority, application Japan, June 14, 1972, 47-70341
Int. Cl. B26d *5/34;* **B65h** *3/44*
U.S. Cl. 83—203 **2 Claims**



1. A copy strip feed error correcting device for copying apparatus of the type wherein an original and a strip of photosensitive material are cooperatingly fed through the apparatus comprising:

a. a speed varying means for setting a common feed speed for said original and said strip of photosensitive material;

b. first drive means for advancing said strip of photosensitive material at a feed speed in accordance with the setting of said speed varying means;

c. second drive means for advancing said original at a feed speed in accordance with the setting of said speed varying means;

d. first detector means for sensing the arrival of a leading end of said strip of photosensitive material and producing a signal in response thereto;

e. second detector means for sensing the arrival of the trailing end of said original and producing a signal in response thereto;

f. cutting means for severing said strip of photosensitive material; and

g. timer means operatively connected to said speed varying means, said second drive means, said first and second detector means and said cutting means for respectively

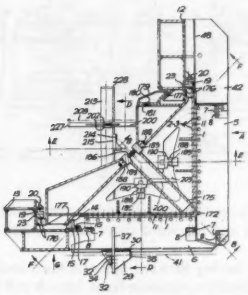
actuating said second drive means and said cutting means in response to said signals from said first and second detector means after a time lapse which is in inverse proportion to the feed speed set by said speed varying means, whereby a sheet of photosensitive material is cut to a length consistent with the length of the original when the feed speed setting is varied by said speed varying means.

3,893,361

APPARATUS FOR SHEARING SHEET MATERIAL

Roger Elwin Harris, 174, Plymouth Rd., Redditch, Worcester, England

Filed May 31, 1973, Ser. No. 365,559
Claims priority, application United Kingdom, May 31, 1972, 25531/72
Int. Cl. B26c 7/02; B26d 7/16
U.S. Cl. 83—375 **9 Claims**



1. In an apparatus for shearing sheet material comprising two simultaneously movable blades with their cutting edges set substantially at right angles to one another, and two static blades whose cutting edges are also set substantially at right angles to one another to co-operate with each of said movable blades, and power operable means for moving said movable blades towards said static blades to cut material, moved into the apparatus between the said blades, in two directions at right angles in a single cut, the improvement comprising the provision of such apparatus of a back gauge adjustable in two mutually perpendicular planes, each parallel to a respective plane of said movable and static blades, to gauge two mutually perpendicular edges of said material prior to said movable blades being power driven towards said static blades to cut said material in two directions at right angles in a single cut to form a substantially rectangular cut blank of material, wherein said back gauge comprises an elongate support, one longitudinal edge of which gauges one edge of the material, and a member slidable therealong one face of which member projects at right angles to said support to gauge the other edge of the material, said support being secured to one of said movable blades within the angle formed by both movable blades for movement therewith along a cut.

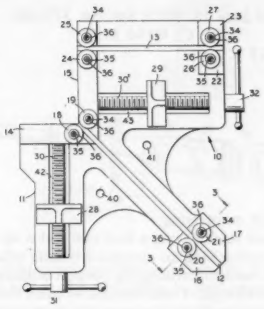
3,893,362

CORNER CLAMP MITRE BOX

Nathan H. Schneider, and Sidney A. Schneider, both of Yonkers, N.Y., assignors to Durall Tool Corporation, Yonkers, N.Y.

Filed June 25, 1973, Ser. No. 373,027
Int. Cl. B27g 5/02
U.S. Cl. 83—763 **6 Claims**

1. A mitre box comprising a base, a slot in said base, a first brace wall near one end of said slot, a second brace wall across said slot opposite said first brace wall, a first upright portion near the other end of said slot, a second upright portion across said slot opposite said first upright portion, said slot at a diagonal between said first and second brace walls and said first and second upright portions, a fixed roller on one of said brace walls, a fixed roller on one of said upright portions, said fixed roilers on said brace wall and said upright portions apposed to each other on the same side of said slot, said fixed rollers substantially tangent to said slot, and a laterally adjustable roller on said brace wall portion opposite said brace wall fixed roller and a laterally adjustable roller on said upright portion opposite said upright fixed roller, at least said adjustable rollers rotatable about sleeves, at least said adjustable rollers' sleeves longer than said adjustable rollers, at least said adjust-



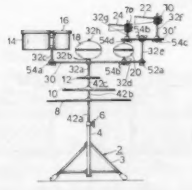
able rollers' sleeves affixed to said respective brace walls and upright portions by screw means, said screw means of said adjustable rollers having a lesser diameter than said sleeves, a second slot in said base and through said second base wall and passing between a further pair of upright portions, said second slot at approximately a right angle in said brace wall and between said further set of upright portions, a fixed roller on one side of said slot on said second brace wall, a fixed roller on one of said further uprights apposed to said second brace wall's fixed roller, said fixed roller substantially tangent to said second slot and a laterally adjustable roller on each said respective second brace walls and said further upright portions opposite said fixed rollers.

3,893,363

KIT PARTICULARLY USEFUL FOR MOUNTING PERCUSSION INSTRUMENTS TO A STAND

Yehuda Cohen, 25 Sokolov St., Tel Aviv, Israel

Filed May 3, 1974, Ser. No. 466,704
Int. Cl. G10d 13/02
U.S. Cl. 84—402 **8 Claims**



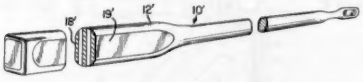
1. A kit particularly useful for mounting various percussion instruments to a stand, comprising: at least one mounting bar formed with a plurality of apertures; and a plurality of rods attachable to the bar by passing them through selected apertures of the bar for supporting various percussion instruments, each of said rods including an externally-threaded end of a diameter to pass through the apertures in the mounting bar, the opposite end of each rod being formed with an internally threaded, axially-extending bore of the same internal diameter

as the externally-threaded end enabling two such rods to be threadedly attached together and to a mounting bar clamped between them, at least one of said rods further including a plastic sleeve lining a portion of its externally-threaded end, and a pair of non-metal apertured discs passing through said externally threaded end for clamping a cymbal between them, with the cymbal when so clamped being isolated from the rod by said plastic sleeve and the two non-metal discs.

3,893,364
DRUMSTICK

Louis Duane Harrison, 2030 Covent Ave., Evansville, Ind. 47714

Filed June 18, 1973, Ser. No. 371,288
Int. Cl. G10d *13/00*
U.S. Cl. 84—422 **5 Claims**



1. A drumstick comprising:

a. an elongated shaft having a butt end and a tip end,

b. said shaft comprising an elongated handle adjacent said butt end, a wooden striking tip portion adjacent said tip end, and an elongated intermediate wooden shaft portion extending longitudinally and coaxially from said handle to said tip portion,

c. said handle comprising opposite flattened side portions, each flattened side portion having a width greater than the cross-sectional dimension of said intermediate shaft portion, and greater than the cross-sectional dimension of said tip portion,

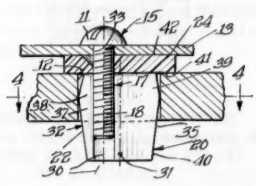
d. said handle further comprising a first radially enlarged portion connecting adjacent longitudinal edges of said flattened side portions and a second radially enlarged portion connecting adjacent opposite longitudinal edges of said flattened side portions, to facilitate gripping of said handle by a drummer,

e. said wooden intermediate shaft portion and said wooden striking tip portion having growth rings extending substantially parallel to the longitudinal axis of said shaft.

3,893,365
PLASTIC SCREW GROMMET

George E. Gross, Arlington Heights, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Dec. 28, 1973, Ser. No. 429,620
Int. Cl.[2] F16B *13/04*
U.S. Cl. 85—80 **11 Claims**

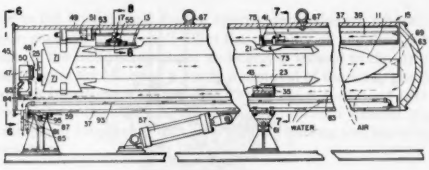


1. A fastening device for use in a workpiece having a round aperture therein, said device including a head and an integral, axially elongated, resilient shank having a generally circular cross-section for intimate acceptance within said aperture, shoulder means located intermediate the ends of said shank for engagement with one surface of the workpiece while said head engages the other surface, a bore traversing said head and a substantial portion of said shank, said bore having an initial diameter smaller than the diameter of a mating screw to cause the shank inserted in said aperture to resiliently expand and engage the surrounding workpiece when the screw is forced along the bore, the bore further having its axis offset and spread-apart from the central axis of the shank an amount sufficient to locate said bore at an eccentric position totally to one side of said shank axis to thereby inhibit rotation of the circular shank in the round workpiece aperture as the screw is turned into the bore.

3,893,366
MISSILE LAUNCHER GUIDE ASSEMBLY

Benjamin D. Murray, Bremerton, Wash., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 29, 1973, Ser. No. 410,847
Int. Cl. F41f *3/02*
U.S. Cl. 89—1.801 **5 Claims**



1. A missile launcher guide assembly for launching a missile having forward and rearward shoes for supporting the missile comprising:

a. a housing having forward and rearward sections;

b. a longitudinally extending fixed launch rail being operatively connected to the forward section of said housing for slidably guiding the forward and rearward shoes of a missile;

c. a longitudinally extending removable launch rail for retaining and slidably guiding the forward and rearward shoes of said missile;

d. a longitudinally extending launch rail support member operably connected to the rearward section of said housing;

e. said launch rail support member having longitudinally extending slots for slidably receiving and supporting said removable launch rail;

f. one end of said longitudinally extending removable launch rail abuting one end of said fixed launch rail and being in axial alignment with said fixed launch rail when mounted in said launch rail support member;

g. said longitudinally extending removable launch rail being slidable through the rear end of said housing;

h. a missile activating means operatively connected to said housing; and

i. a missile actuating mechanism operatively connected to said housing for sliding a missile rearward on said removable launch rail and into contact with said missile activating means.

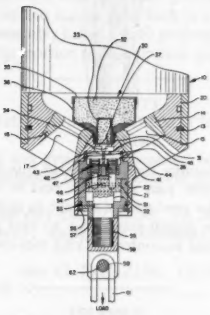
3,893,367
MECHANICALLY INITIATED IGNITER

Vernon D. Burklund, China Lake; Joseph A. Schmidt, Ridgecrest, and Michael D. Jacobson, Inyokern, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 10, 1974, Ser. No. 478,010
Int. Cl.[2] F41F *15/00*
U.S. Cl. 89—27 R **4 Claims**

1. A propellant ignition mechanism for a rocket motor utilized to tow a load by means of a tow line fastened concentric with the center of the rocket motor and rearward of the nozzles comprising:

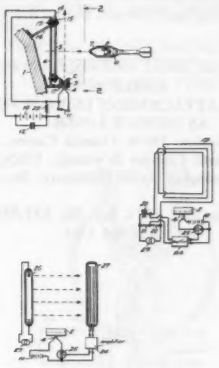
a chamber having an intermediate counter bore and axially rearwardly disposed bore with the center lying on a line through the longitudinal axis of the rocket motor;
first guide member formed into a piston chamber with a necked down collar positioned within said chamber;
piston means having a first shear pin for holding said piston means from operative movement within said guide member;
firing pin guide means extending through the top surface and a substantial distance into the body of said piston means;



firing pin means in slidable engagement with said firing pin guide means and held immovable by second shear pin means;
bias means operatively attached to said firing pin means to oppose a pulling force urging said psiton means in a rearward direction; and
ignition means positioned adjacent said firing pin means;
whereby a rearward pull of a first predetermined force on the piston means shears the first shear pin to allow the piston means to move against the opposing motion of the basing means until a second predetermined force is exceeded to break the second shear pin means and allow the firing pin means to be driven against the ignition means.

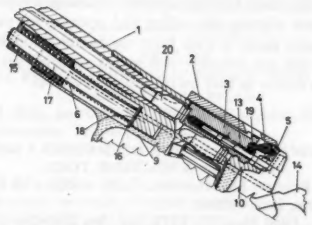
3,893,368
DEVICE FOR THE PROTECTION OF TARGETS AGAINST PROJECTILES
Nathaniel B. Wales, Jr., Morristown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Dec. 1, 1954, Ser. No. 472,541
Int. Cl. F41h *9/00*
U.S. Cl. 89—36 R **5 Claims**

1. In a device for protecting a target from attack by a projectile the combination comprising a linear shaped charge to generate a jet sheet of high velocity particles, the plane of symmetry of said shaped charge disposed in spaced relation to said target and substantially at right angles to the projectile trajectory, a detonator to initiate explosion of said shaped charge, a source of electrical energy to fire said detonator, and a switch responsive upon impact of said projectile to establish connection between said source of electrical energy and said



detonator said switch comprising a plurality of plates disposed in parallel planes and distortable by said projectile impact.

3,893,369
INERTIA DEVICE FOR RETARDING THE UNLOCKING OF A BOLT ASSEMBLY
Giovanni Benelli, Urbino, Italy, assignor to Benelli S.p.A. Divisione Armi, Urbino, Italy
Filed Feb. 23, 1973, Ser. No. 334,976
Claims priority, application Italy, Feb. 29, 1972, 44012/72
Int. Cl. F41d *1/08*
U.S. Cl. 89—182 **2 Claims**



1. An automatic firing and defense pistol comprising
a fixed barrel having an axis;
a bolt carrier axially aligned with said barrel and located adjacent thereto;
said bolt carrier including a stop element extending transversely to said axis;
a bolt assembly slidably mounted within said bolt carrier, said bolt assembly having a plurality of projecting ribs, and said ribs having faces inclined with respect to said axis;
a receiver breech attached to said barrel and including a plurality of grooves corresponding to and providing mating engagement with said ribs prior to firing of the pistol; a link having one end pivotally mounted on an end of said bolt assembly remote from said barrel and the other end of said link freely bearing against said stop element;
a preloaded spring associated with said barrel and applying a bias to said stop element thereby exerting a thrust force on said link to maintain engagement of said ribs;

said link having an inclination of approximately 45° to said axis prior to firing, and said link temporarily maintaining said inclination and rib engagement upon firing due to inertia force of said bolt carrier and stop element; and

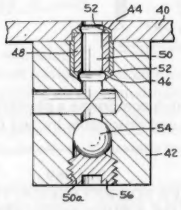
said link movable to be axially aligned with said barrel due to force of residual gases following firing thereby allowing disengagement of said ribs and sliding movement of said bolt assembly.

3,893,370

GAS CYLINDER ATTACHMENT USING A FORMED PIN AS ORIFICE LINER

James Cameron Hutton; Merle Francis Carter, both of Mohawk, and Kenneth Charles Rowlands, Utica, all of N.Y., assignors to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Jan. 30, 1974, Ser. No. 437,854
Int. Cl. F41d *5/04*
U.S. Cl. 89—193 **10 Claims**



1. A firearm having an elongated barrel through which a projectile means is propelled by explosive propellant gases, an orifice, in said barrel for bleeding off said explosive gases after the projectile means has passed the orifice, a gas cylinder positioned adjacent to said barrel and having an opening in substantial alignment with said barrel orifice, a hollow spring pin means positioned in and biased outwardly against the barrel orifice and the gas cylinder opening for accurately locating and aligning the orifice and opening for permitting the explosive gases to pass from the barrel through the pin means to the gas cylinder, and means securing said hollow spring pin means to said barrel and gas cylinder.

3,893,371

METHOD AND MEANS FOR OPERATING A SPINDLE DRIVE IN A MACHINE TOOL

James L. Frazier, Los Alamitos, Calif., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Mar. 27, 1972, Ser. No. 238,434
Int. Cl. B23c *5/26;* **B23q** *21/00*
U.S. Cl. 90—11 A **6 Claims**

1. A machine tool comprising in combination:

a. a head;

b. a quill non-rotatably slidably mounted on said head for axial movement with respect to said head during machining;

c. a spindle rotatably carried by and within said non-rotatable quill for joint axial movement with said quill with respect to said head, and adapted to drivably carry a tool;

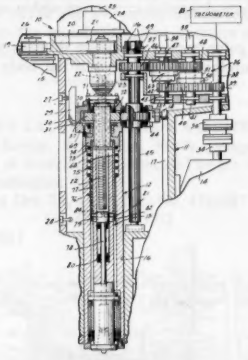
d. a spindle motor drivably connected to said spindle to rotate it;

e. a quill motor drivably connected to said quill to reciprocate said quill and said quill-supported spindle;

f. a detent wheel connected at all times to be rotatably driven at a speed having a fixed ratio to the spindle speed, and having at least one peripheral detent;

g. a movable stop member disposed to be driven into and retracted from said spindle detent for locking said spindle in a predetermined angular position after said spindle motor has been fully deenergized;

h. means defining a pressurized air inlet port directed toward said spindle;



i. a ring corotatably carried on said spindle and having a bulge rotatable past said inlet port to restrict air flow therefrom for producing a change in static pressure; and

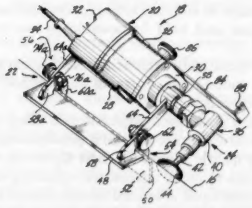
j. a pressure switch responsive to said pressure change and connected to control locking movement of said stop member.

3,893,372

FINISHING TOOL

Heinz Strakeljahn, 13228 S. E. 231 St., Kent, Wash. 98031

Filed Aug. 6, 1973, Ser. No. 385,955
Int. Cl. B23c *1/20*
U.S. Cl. 90—12 D **8 Claims**



1. A hand operable power tool especially adapted for finish trimming an edge portion of a structure, such as that formed by the juncture of two surface sheets on a substrate, which sheets lie in different planes and meet at a juncture line, as for example, two laminated plastic sheets joined to top and side surfaces of a counter top, said tool comprising:

a. a main housing having forward, rear, top and bottom portions, said housing having a longitudinal axis,

b. a mounting base attached to said housing and comprising a first guide foot providing a first contact surface adapted to engage one of said surface sheets, and a second guide foot providing a second contact surface adapted to engage the other of the surface sheets, thereby orienting said housing with respect to said edge portion, while permitting travel along said edge portion,

c. said mounting base further comprising longitudinally oriented pivot means permitting angular adjustment of said housing about said guide feet along a generally longitudinal axis, whereby the angle of engagement of said tool

with said edge portion can be varied, and said pivot means is at a location proximate a juncture line of planes defined by the contact surfaces of said first and second guide feet, whereby said working assembly remains in proper position for engagement with said edge portion when the angular position of said tool is adjusted about said axis, and

d. a working assembly comprising a right angle power transmission housing comprising a first longitudinal housing portion and a second transmission housing portion depending from the forward end of the longitudinal transmission housing portion and carrying a working shaft adapted to hold a trimming head at the lower end thereof, the lower end of the shaft being positioned forwardly of said main housing and said mounting base, so that a trimming head on said shaft can operate forwardly of said main housing and said mounting base,

whereby said tool can be oriented by said guide feet into working engagement with said edge portion and moved forwardly into a limited access area, such as a blind corner, with said working assembly being able to perform a finishing operation on the edge portion in said limited access area.

3,893,373

PROGRAMMING SYSTEM FOR MACHINE TOOLS OR THE LIKE

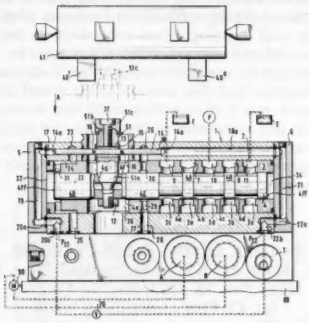
Hubert Bernd, and Friedel Liedhegener, both of Lohr, Main, Germany, assignors to G. L. Rexroth GmbH, Lohr, Main, Germany

Filed July 26, 1973, Ser. No. 382,712

Claims priority, application Germany, July 27, 1972, 2236801

Int. Cl. F15b *21/02, 13/16*

U.S. Cl. 91—35 **5 Claims**



1. In a programming system for machine tools or the like the combination of a control member having a plurality of projections each movable to and from a predetermined position in response to actuation of the control member; a hydraulic flow regulating valve including a housing, a valve member having an extension provided with two cylindrical guide portions slidable in said housing, said valve member being reciprocable in said housing between a neutral position and two operative positions, a follower extending laterally from said housing and being fixedly secured to said extension of said valve member between said guide portions thereof, and a plunger parallel to said valve member fixedly secured to said follower and movable in said housing by a pressurized control fluid to shift said valve member from said neutral to a selected operative position; and means for moving said housing and said control member relative to each other, said follower being in register with each projection which assumes said predetermined position to move said valve member from an operative position selected by said plunger back to said neutral position while said housing and said contral member move relative to each other after said follower engages one of said projections in said predetermined position.

3,893,374

CIRCUIT BREAKER OPERATING DEVICE

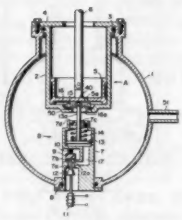
Kunio Hirasawa, Ibaraki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed June 24, 1974, Ser. No. 482,728

Claims priority, application Japan, July 4, 1973, 48-74823

Int. Cl. F15b *11/08*

U.S. Cl. 91—461 **21 Claims**



1. A circuit breaker operating device comprising a storage tank filled with an operating fluid under pressure; circuit breaking mechanism actuating means including a cylinder fixed to said storage tank and having an inlet port disposed within said storage tank, and a first piston disposed slidably within said cylinder and operatively connected to the movable contact in the circuit breaking mechanism; a fluid introducing valve disposed to openably close said inlet port of said cylinder so as to permit flow of the operating fluid under pressure contained in said storage tank into a main introducing space defined between said first piston and said cylinder in the position in which it opens said inlet port and to shut off the flow of the operating fluid into said main introducing space in the position in which it closes hermetically said inlet port; and valve actuating means including a second piston for controlling the movement of said fluid introducing valve in response to the application of a breaking instruction signal.

3,893,375

AXIAL PISTON HYDRAULIC DEVICE WITH FORCED LUBRICATION MEANS

Allyn J. Hein, and Gilbert Tribley, both of Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 7, 1973, Ser. No. 330,414

Int. Cl. F01b *13/04*

U.S. Cl. 91—486 **1 Claim**

1. A rotary hydraulic device comprising:

a housing having a chamber therein,

a shaft extending into said housing and being journalled thereto for rotation about an axis extending therein,

an annular barrel member disposed in said housing in coaxial relationship to said shaft and being coupled thereto for rotation about said axis with said shaft, said barrel having a plurality of angularly spaced cylinder bores extending parallel to said axis, wherein said barrel member has internal splines engaging external splines on said shaft to couple said barrel member thereto,

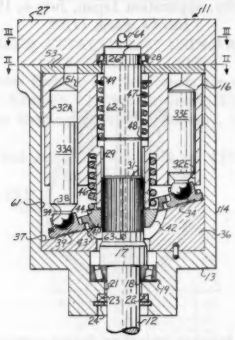
a plurality of pistons each being disposed in an individual one of said cylinder bores for reciprocation therein and having an end protruding from said bore,

means disposed within said housing chamber and engaging said protruding ends of said piston for causing each piston to reciprocate in the associated one of said cylinder bores as said barrel rotates,

port means in said housing for admitting fluid to said cylinder bores when said pistons therein are moving away from said port means and for releasing fluid from said bores

when said pistons therein are moving towards said port means, and

means defining a fluid drain passage for said housing chamber, said drain defining means being communicated with said chamber at a point which is radially inward from the circumferential portions thereof and which is at least in proximity to said rotary axis whereby said fluid must move radially inward relative towards said axis in order to escape from said chamber, and wherein at least a portion of said drain passage is defined by at least one omitted one of said splines.



3,893,376

RADIAL PISTON MACHINE

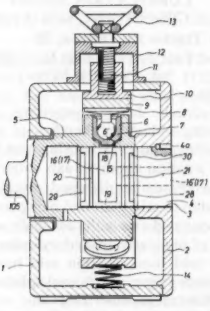
Gerhard Nonnenmacher, Korntal, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Sept. 24, 1973, Ser. No. 399,821

Claims priority, application Germany, Oct. 2, 1972, 2248316

Int. Cl. F01b *13/00*

U.S. Cl. 92—55 **19 Claims**



1. In a radial piston machine, a pintle for a cylinder block wherein pistons move radially under the action of a slide block in response to rotation of the cylinder block around the pintle in the interior of a housing, said pintle having a peripheral surface provided with high-pressure and low-pressure chambers extending in the circumferential direction of said pintle, lands separating said chambers from each other, a pair of sealing elements extending circumferentially of said pintle and being spaced apart from opposite sides of said chambers, recesses extending circumferentially of said pintle and each located between said chambers and one of said sealing elements, a first pair of sealing projections disposed between said recesses and said high-pressure chamber, and a second pair of sealing projections disposed between said recesses and said low-pressure chamber, the area of each of said sealing elements in the region of said high-pressure chamber being less than the area of each of said sealing elements in the region of said low-pressure chamber.

3,893,377

HYDRAULIC SERVOMOTOR

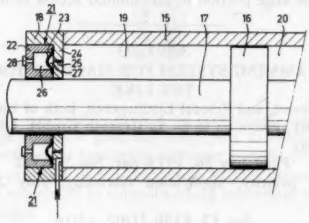
Jacob Johan't Mannetje, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 9, 1973, Ser. No. 404,337

Claims priority, application Netherlands, Oct. 17, 1972, 7214004

Int. Cl. F01b *31/14*

U.S. Cl. 92—60 **3 Claims**



1. A hydraulic servomotor comprising a controlled motor space, means for conducting hydraulic medium to said space, and means for damping oscillations of pressure of the hydraulic medium, said damping means comprising an accumulator having first and second compartments separated by a flexible diaphragm, said accumulator comprising a disk member and a block member, said disk member being a wall of said first compartment, and a viscous flow restriction means for connecting said first compartment directly to said motor spaces, said viscous flow restriction means being at least one restrictive passage through said disk member, said second compartment containing a gas under pressure.

3,893,378

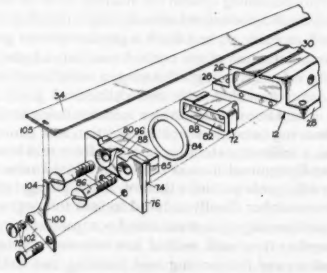
DOUBLE ACTING FLUID CYLINDER

Delbert C. Hewitt, 522 S.E. Alder, Portland, Oreg. 97214

Filed Nov. 23, 1973, Ser. No. 418,564

Int. Cl. F16j *13/02, 15/16, 15/50*

U.S. Cl. 92—88 **4 Claims**



1. A double acting fluid cylinder comprising an elongated cylinder housing having opposite ends, a plug fitted snugly in each end of said housing having an outer end edge and a central recess, a cap disposed at each end of said housing, an

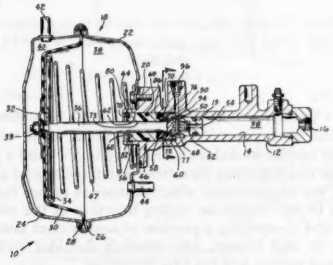
end flange on said caps abutted against respective ends of said housing, screw means extending through said flange and engageable with said housing to secure said caps on the housing, a reduced end portion on said caps extending into the recesses of respective plugs, said reduced end portions forming an inwardly directed shoulder on said caps, a resilient sealing ring between the shoulders of said caps and the outer edges of respective plugs, screw means extending through said caps and engageable with respective plugs for securing the caps and plugs together and also to compress said sealing rings for accomplishing a positive seal between said cap and said housing, a pair of ports located at opposite ends of said housing respectively to serve alternately as inlet and outlet ports, a piston assembly slidably mounted in said cylinder housing, means defining a slot extending longitudinally along one side of said housing, an arm on said piston assembly projecting through said slot and arranged to be connected to means to be driven, a flexible strip extending longitudinally of said housing interiorly thereof covering said slot from the inside and sealing the latter on opposite sides of said piston assembly by internal fluid pressure, means defining a groove in said piston assembly slidably engaging said strip, means anchoring one end of said strip to one of said caps, said strip at its end opposite from the anchored end having an aperture therein, and a leaf spring lever secured at one of its ends to the adjacent cap and having its other end engaged in said aperture, said other end extending toward said strip but normally positioned outwardly from said aperture longitudinally of the housing when not engaged in said aperture whereby said spring is flexed when engaged with said aperture and a tensioning force is exerted and maintained on said strip for positive sealing by said strip.

3,893,379

PUSH ROD BEARING AND SEAL MEANS

Maxwell L. Cripe, and Richard H. Rosback, both of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Filed Mar. 1, 1974, Ser. No. 447,459
Int. Cl. F16j *15/18*; F01b *19/00*; F16j *3/00*
U.S. Cl. 92—94 **5 Claims**



1. In a servomotor, a bearing and seal means retained in a first section of a bore in a housing for aligning a push rod attached to a movable wall in a power producing chamber with a piston retained in a second section of said bore to prevent air from being communicated from the power chamber into the first section in a first condition and to prevent fluid under pressure present in the first bore from being communicated into the power producing chamber in a second condition, said bearing and seal means comprising:

a cylindrical member having a first end and a second end with an axial bore concentric to the first section, said cylindrical member having a first annular groove on its peripheral surface, and a second annular groove on its second end, said peripheral surface on the cylindrical member substantially matching that of the first section of the housing, said axial bore being adapted to receive said push rod;

first resilient means located in said first annular groove for preventing the occurrence of said first and second conditions along the periphery of said cylindrical member;

second resilient means having a first projection extending from a first side of a disc section and a second projection having a rib on the end thereof, said rib being adapted to bias the second projection into an interference contact with said push rod, said second resilient means preventing the occurrence of the first and second conditions along the axial bore of the cylindrical member;

spacer means located in the first section between the second end of the cylindrical member and a shoulder adjacent the second section of said bore, said spacer means overlying a portion of said disc to rigidly position said first annular projection in the second annular groove; and

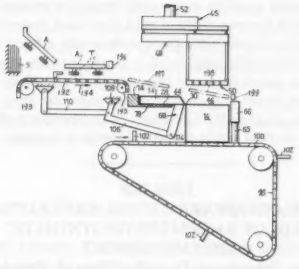
keeper means secured to said housing for maintaining said cylindrical member and said spacer means in a stationary position within said first section of said bore.

3,893,380

MACHINE FOR ERECTING A CARTON BLANK TO A CARTON

Kay Arne Wallin; Bengt Anders Ewjen, and Jan Ingemar Nilsson, all of Halmstad, Sweden, assignors to Sprinter Pack AB, Halmstad, Sweden

Filed May 11, 1973, Ser. No. 359,449
Claims priority, application Sweden, Dec. 21, 1972, 16812/72
Int. Cl. B31b *1/46*
U.S. Cl. 93—51 HW **14 Claims**



1. Apparatus for erecting cartons from a substantially flat carton blank having tray and lid portions, side panels forming the sides of said tray portion and side panels forming the sides of said lid portion wherein said lid portion is hingedly coupled to one of said tray portion side panels along a fold line, said apparatus comprising:

blank receiving means having first and second cavities positioned adjacent one another and each having a stationary floor and a common pair of sidewalls;

said floors being positioned adjacent one another;

reciprocating plunger means having first and second bottom surfaces respectively cooperating with the floors of said first and second cavities;

said first and second surfaces being adapted to respectively enter said first and second cavities when said plunger is moved in a carton erecting direction to press the lid and tray portions of a carton blank respectively against said first and second floors and cause said lid and tray side panels to be moved to the erected position;

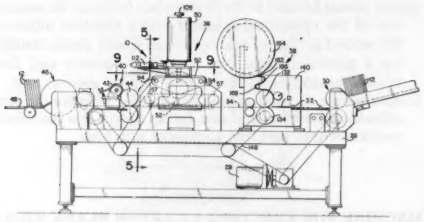
means for moving the erected carton out of said cavities when said plunger moves in a reset direction.

3,893,381

ENVELOPE FASTENER ATTACHING MACHINE

William A. Chapman, Hubbardston, and John J. Crowley, Ware, both of Mass., assignors to United States Envelope Company, Springfield, Mass.

Filed Nov. 7, 1973, Ser. No. 413,699
Int. Cl. B31b *1/90*
U.S. Cl. 93—61 B 34 Claims



1. A machine for attaching a fastener including a clasp having a base and a plurality of attaching prongs to an envelope, said machine comprising means for continuously advancing an envelope along a generally predetermined path and a clasp attaching unit mounted in said path and including a prong clinching anvil, means for positioning said anvil in engagement with one panel of the continuously advancing envelope and for continuously advancing said anvil along at least a portion of said path in engagement with the one panel, a clasp attaching element supported for movement relative to said anvil, means for releasably retaining a clasp on said attaching element, and means for moving said attaching element relative to said anvil to move said retaining means with the clasp retained thereon toward said anvil and generally along a portion of said path with the continuously advancing envelope and anvil while said anvil is positioned in engagement with the one panel to cause the prongs of the clasp to penetrate the one panel and clinchingly engage the anvil whereby to attach the clasp to the one panel by cooperation of the base and prongs thereof while the envelope is in motion.

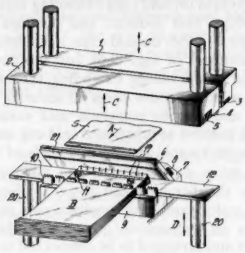
3,893,382

PROCESS AND APPARATUS FOR MANUFACTURING PADS OF BAGS MADE OF SYNTHETIC THERMOPLASTICS

Frank Bosse, Ibbenburen-Dorenthe; Konrad Tetenborg, and Friedhelm Mundus, both of Lengerich, all of Germany, assignors to Windmoller & Holscher, Lengerich, Germany

Filed Nov. 7, 1973, Ser. No. 413,457
Claims priority, application Germany, Nov. 7, 1972, 2254448
Int. Cl. B31b *1/64, 1/98*
U.S. Cl. 93—93 HT 8 Claims

1. Apparatus for manufacturing pads of bags made of synthetic thermoplastics, comprising a welding means and a severing means which extends over the width of the thermoplastic tubing being formed into bags and operate in step with the intermittent advance of the thermoplastic tubing through the apparatus, piercing means positioned downstream of said severing means, perforating means positioned downstream of said piercing means, and tools extending transversely to the tubing over the width thereof, said welding means comprising a welding bar, which bar is transversely disposed with respect to said tubing between said severing means and said perforating means so as to cooperate with said severing and perforating means to join the last formed bag to the preceeding formed bag, and a vertically moveable support, which support is adapted to be raised or lowered in accordance with the increasing height of the pad of bags, said support positioned so as to support bags approximately adjacent said piercing and perforating means, said support being adapted to push the pad



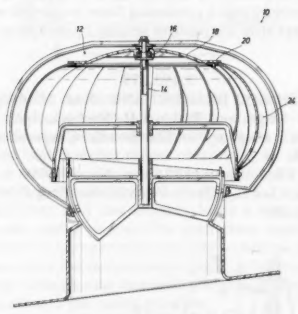
of bags from the piercing and the perforating means when said pad has a desired height.

3,893,383

TURBINE VENTILATOR

James D. Jones, 6309 Westline Dr., Houston, Tex. 77036

Filed Mar. 19, 1974, Ser. No. 452,543
Int. Cl. F23l *17/02*
U.S. Cl. 98—72 7 Claims



1. In a turbine ventilator which includes a rotatable turbine supported by a generally upright support shaft where the rotatable turbine includes a central top bonnet and a plurality of similar ribs extending therefrom which are spaced about the bonnet, the improvement which comprises means for joining the ribs to the bonnet on sliding insertion of the ribs into a mating slot comprising a portion of said bonnet and aligned relative to said bonnet, and abutting shoulder lock means preventing retrieval of the ribs therefrom.

3,893,384

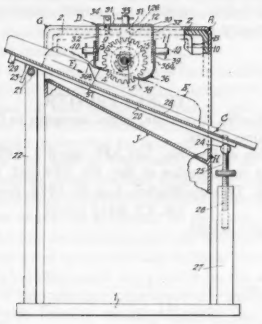
CURED MEAT PROCESSING MACHINE

Salvatore J. Lo Biondo, 12 Decamp Ct., West Caldwell, N.J. 07006, and Joseph V. Lo Biondo, 12 Winding Ln., Bloomfield, N.J. 07003

Filed May 17, 1973, Ser. No. 361,231
Int. Cl. A22c *9/00*
U.S. Cl. 99—485 5 Claims

1. A meat processing machine comprising a frame having spaced and opposed vertical supports, a horizontal macerating blade shaft removably rotatably journaled in said supports and having a plurality of circular blades mounted thereon in spaced apart relation longitudinally thereof, a meat-supporting table removably mounted on said frame beneath said blades along which a piece of meat may be slid in contact with said blades for slitting said meat, a pressure device including

an inverted channel shaped beam having a main wall separably and rigidly secured at its ends on said supports, respectively, above said shaft and blades and having depending spaced and parallel side walls covering and embracing said blades, and a channel-shaped pressure plate device having a flat bottom wall and parallel side flanges mounted on said



beam with said bottom wall beneath said shaft to be engaged by the top surface of said meat, said bottom wall having slots through each of which extends one blade and said flanges extending upwardly in sliding contact with the respective side walls of the beam, and means adjustably securing said flanges to said side walls for up and down movement of said bottom wall.

3,893,385

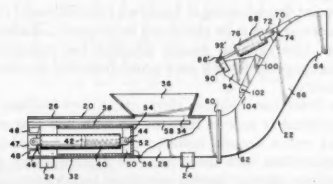
HORIZONTAL TRASH COMPACTOR

Lewis P. White, 3436 Brookwood Rd., Birmingham, Ala. 35223

Continuation-in-part of Ser. No. 55,706, July 17, 1970, Pat. No. 3,657,999. This application Apr. 24, 1972, Ser. No. 246,640

Int. Cl.[2] B30B *15/28*

U.S. Cl. 100—53 **18 Claims**



1. A trash compactor comprising:

a. an elongated chamber,

b. said chamber including a rectilinear section and a curvilinear section,

c. said curvilinear section being of S-shape conformation and comprising a pair of spaced, reversely curved portions connected by a straight portion,

d. means for admitting trash to the interior of said rectilinear section,

e. a packer assembly movable longitudinally of said rectilinear section for forcing trash in advance thereof into said S-shape curvilinear section, whereby the trash is compressed by frictional engagement with the wall thereof, and

f. power means engageable with said packer assembly for moving the latter longitudinally of said rectilinear section.

3,893,386

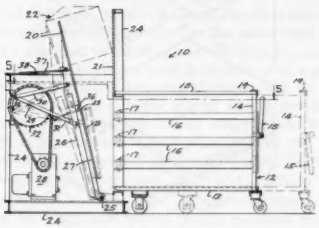
BOX BALING MACHINE AND CART

William P. Wise, Napoleon, Ohio, assignor to Ohio Baler Corporation, Napoleon, Ohio

Filed Oct. 4, 1973, Ser. No. 403,381

Int. Cl. B30b *15/14*

U.S. Cl. 100—50 **14 Claims**



1. An apparatus for crushing, compacting and baling compactible charges, said apparatus comprising a frame having a rigid abutment thereon, a crushing platen adjacent said abutment, a baling container adjacent said frame, a baling and compacting platen adjacent said baling container and said crushing platen, shielding means positioned between said crushing platen and said baling and compacting platen for directing a charge between said compacting platen and said baling container, said shielding means including a generally horizontal shield member positioned below the lower edge of said crushing platen during various positions of said platens and eccentric driving means connected to said crushing platen and said compacting platen for effecting reciprocating communication between said crushing platen and said abutment and for effecting reciprocating communication between said compacting platen and said baling container, whereby a charge loaded between said crushing platen and said abutment is crushed by said crushing platen and forced by said compacting platen into said baling container.

3,893,387

COMPACTOR HAVING IMPROVED CABINET STRUCTURE

William A. Eckerle, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed June 5, 1974, Ser. No. 476,529

Int. Cl. B30b *15/04*

U.S. Cl. 100—229 A **8 Claims**

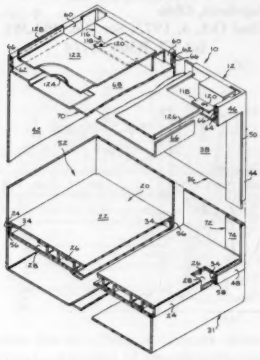
1. A compactor of the type comprising a cabinet having a top, a bottom, opposed sides, a closed back, an open front and a door closing the open front; means for mounting an open-topped refuse receiving container to said door for movement through the open front between positions in and out of the cabinet; and means for compressing refuse in the container, including a downwardly movable platen adapted to enter the open top of the container when the container is in the cabinet; a floor, inside the cabinet, having a central section for supporting the container during refuse compression and a downturned edge extending at least along both sides and the back of the cabinet;

a one-piece sheet metal member, generally U-shaped in horizontal cross section, providing opposed side walls each lying substantially in a single plane constituting the cabinet sides and a planar back wall constituting the closed cabinet back, the upper and lower portions of the side and back walls being reverted to provide an upper and lower groove respectively extending at least along both sides and the back of the cabinet and opening re-

spectively downwardly and upwardly, the downturned floor edge cooperating with the lower groove; and

a top wall having a central section for reacting against the compression means during refuse compression and an upturned edge extending at least along both sides and the back of the cabinet and cooperating with the upper groove thereof;

the cabinet being free of convolutions forming stress-bearing columns in the side walls and back.



3,893,388

LABELING DEVICE WITH AN INSTALLATION FOR MARKING LABELS

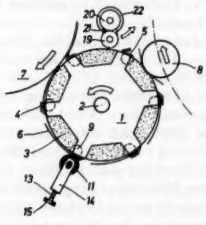
Hermann Kronseder, Neutraubling, and Franz Wetter, Regensburg, both of Germany, assignors to Hermann Kronseder, Neutraubling, Germany

Continuation of Ser. No. 223,204, Feb. 3, 1972, abandoned. This application July 20, 1973, Ser. No. 381,184

Claims priority, application Germany, Feb. 20, 1971, 2108256; Apr. 24, 1971, 2120241; July 17, 1971, 27471

Int. Cl. B41l *21/06*

U.S. Cl. 101—91 **8 Claims**



1. In a label applying turret for picking labels from an extraction cylinder at one side of the turret and transferring the labels to objects to be labeled at another side of the turret, said turret having a series of outwardly facing label transfer and support pads and grip means at the leading edge of the pads to hold labels on the pads as the turret rotates between the extraction cylinder and the objects to be labeled, the improvement comprising a corresponding series of outwardly facing label markers mounted on the turret adjacent to the leading edge of the pads and substantially flush with said pads, each label marker being associated with a corresponding pad whereby respective labels gripped by the grip means and carried by said pads also lie against associated adjacent markers, and inwardly pressing means for pressing the labels against the markers to cause marked impressions on the labels in the course of transfer of the labels from the extraction cylinder to the objects to be labeled, said grip means respectively comprising for each pad a pair of gripper elements disposed adjacent the opposite sides of the marker at the leading edge of that pad whereby to grip the leading edge of the label in close proximity to and at opposite sides of the marker and hold the leading edge of the label between said gripper elements against movement during the marking thereof between said gripper elements.

3,893,389

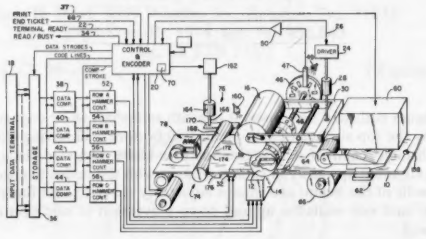
TICKET PRINTER

Robert D. Kodis, Brookline, Mass., assignor to Di/An Controls, Inc., Boston, Mass.

Continuation of Ser. No. 347,349, April 2, 1973, abandoned, which is a continuation of Ser. No. 259,090, June 2, 1972, abandoned. This application Aug. 9, 1974, Ser. No. 496,058

Int. Cl. B41j *15/00*

U.S. Cl. 101—93.07 **16 Claims**



1. A system for printing selected characters on a web having spaced indicia thereon, said system comprising:

a. web feeding means for selectively advancing the web, said web feeding means including first and second means adapted for mutually exclusive engagement and disengagement with the web, the web being advanced when said first means is engaged and said second means is disengaged, the web being held stationary when said second means is engaged and said first means is disengaged;

b. a print drum having at least two rows of raised characters disposed about its periphery in arcuate columns;

c. ink impregnated means adapted for engagement and disengagement with said print drum for transferring ink thereto;

d. at least two ballistic elements, a first ballistic element mounted in spaced registration with one row of characters and a second ballistic element mounted in spaced registration with the other row of characters, each said ballistic element having energized and deenergized states;

e. third means including optical sensor means communicating with said first and second means;

f. fourth means electrically communicating with said third means and ballistic elements for controlling the state of each said ballistic element, said fourth means including a plurality of data comparators and a plurality of ballistic element controls, one each of said plurality of data comparators and one each of said plurality of ballistic element controls being associated with one each of said rows;

g. encoder means coupled to said print drum for generating selected signals representing the position of each said character, said encoder means electrically connected to said third means;

h. rotary cutter means electrically communicating with said third means, said cutting means responsive to a first signal

generated by said third means, said rotary cutter means operating to sever the web;

i. said optical sensor means positioned between said print drum and said rotary cutter means, said optical sensor means detecting a selected one of the indicia disposed between said print drum and said rotary cutter means;

j. said web feeding means advancing the web to a selected position between said print drum and said ballistic elements in response to position signals generated by said optical sensor means, said position signals generated by said optical sensor means when the selected one of the indicia is disposed between said print drum and said rotary cutter means;

k. said fourth means receiving signals from said third means and, in response thereto, generating signals for energizing selected ones of said ballistic elements, said signals received from said third means being responsive to said selected signals generated by said encoder means;

l. portions of the web in registration with an energized ballistic element being pressed against the character in spaced registration with said energized ballistic element, whereby the character is printed on the web;

m. said web feeding means incrementally advancing the web between said print drum and said ballistic elements until all the selected characters are printed on the web;

n. when all of the selected characters are printed on the web, said web feeding means advances the web until another selected one of the indicia is disposed between said print drum and said rotary cutter means and is detected by said optical sensor means;

o. when the other one of the indicia is detected by said sensor means, a portion of the web is severed by said rotary cutter means and the unsevered portion of the web being in position for the printing of selected characters.

3,893,390

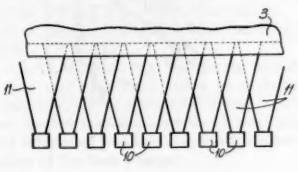
PRINTER WITH RECTILINEAR TYPE-CARRYING BELT

Jacques Roland Deproux, Sevres, France, assignor to Honeywell Information Systems Inc., Waltham, Mass.

Continuation of Ser. No. 249,304, May 1, 1972, abandoned. This application Aug. 15, 1973, Ser. No. 388,506

Int. Cl. B41j 1/20

U.S. Cl. 101—111 **9 Claims**



1. A printer comprising:

a plurality of print characters linearly supported on a moveable belt, said belt being moveable in a first direction parallel to a print receiving means;

a plurality of flexibly mounted print hammers for driving said linearly supported print characters in a second direction toward said print receiving means, said second direction being perpendicular to the first direction of motion of the print characters, each of said flexibly mounted print hammers being mounted at one end of a leaf spring, the other end of said leaf spring being fixedly attached to the frame of said printer,

a plurality of print hammer actuating means for moving said print hammers in said second direction; and

a plurality of intermediate members, each of which is disposed between one of said print hammers and said print characters,

means for resiliently mounting said intermediate members to the frame of said printer for movement under the action of said print hammers in said second direction only between said print hammers and said print characters, the arrangement of the intermediate member between one of said print hammers and said print characters being such as to prevent any lateral displacement in said first direction of any print hammer when said means for resiliently mounting said intermediate members to the frame of said printer comprises pairs of elastic leafs wherein each of said intermediate members is held between the free ends of a pair of elastic leafs, the length of said elastic leafs being substantially perpendicular to the direction of motion of said member, and wherein the other ends of said leafs are attached to the frame of said printer; and

wherein each of said pair of leafs associated with a particular member comprise two end portions and an angled middle portion, wherein the angled middle portion of a leaf attaching to one side of an intermediate member extends in an opposite direction relative to the middle portion of the leaf attaching to the opposite side of the intermediate member, and said end portions which fixedly attach to the frame are spaced apart by the amount by which said angled middle portions extend in opposite directions.

3,893,391

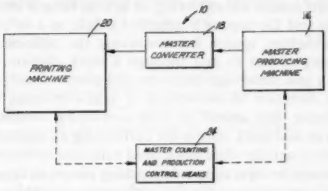
CONTROL CIRCUIT FOR MASTER QUANTITIES IN PRINTING SYSTEMS

Thomas J. Borke, Schaumburg, and Donald W. MacDonald, Barrington, both of Ill., assignors to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed May 21, 1973, Ser. No. 362,370

Int. Cl. B41f 7/02

U.S. Cl. 101—141 **5 Claims**



1. In a printing system including a planographic master producing portion, a cyclically operable printing portion and a transport for causing movement of the planographic masters between the producing portion and the printing portion of said printing system, said printing portion and transport having the capability of successfully containing at predetermined detection locations only a predetermined plural number of masters at one time, and said master producing portion having a speed potential for introducing more than said predetermined number of masters before the presence of the excess is detectable at the predetermined locations, an improvement in controlling the number of planographic masters present in the printing system, comprising:

means operable during the initial startup of the system for counting the number of masters initially produced by said producing portion and producing a signal when said predetermined number has been counted; and

control means responsive to the signal provided by said counting means for so controlling operation of said master producing portion that no more than said predetermined number of planographic masters is ever present in said printing system,

said control means having a dual mode of operation allowing, during said initial production of masters and prior to the production of said signal, uninhibited production of masters until said predetermined number has been

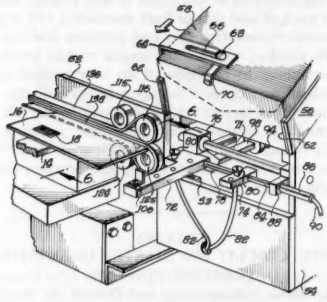
counted, and thereafter admitting a new master into the system upon the departure of a previous master therefrom.

3,893,392

ARTICLE FEEDING APPARATUS FOR ENGRAVING PRESS OR THE LIKE

Reinhart Brenn, Lombard; Thomas F. O'Neill, Posen, and James Shenoha, Lockport, all of Ill., assignors to Bron Electronics, Inc., Bridgeview, Ill.

Filed Jan. 2, 1973, Ser. No. 320,529
Int. Cl. B41f *1/32, 21/06*
U.S. Cl. 101—150 **12 Claims**



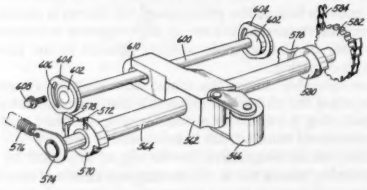
1. Apparatus for performing an engraving operation on a substantially flat article, and comprising means for supplying a plurality of such articles in a stack and for feeding such articles substantially perpendicular to their faces, pivotally mounted means for removing an article from a stack of such articles and for tipping a removed article to a different plane of orientation, means for conveying the articles from said removing means to and through a work station, means for shifting said removing means in said plane of orientation and in the direction of movement of said conveying means for transfering the article to said conveying means, working means at said work station for performing an engraving operation on an article while associated with said conveying means, and means for operating said working means in timed relation to said conveying means for performing a working operation on an article by said working means at said work station.

3,893,393

PLATEN ALIGNMENT CONTROL

Gary G. See, Chagrin Falls, Ohio, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Mar. 1, 1974, Ser. No. 447,234
Int. Cl. B41f *3/56*
U.S. Cl. 101—269 **6 Claims**



1. In a data recorder in which a bed anvil provides a support plane for a raised character print plate, a rail support system which establishes a guide path over the bed anvil, and a platen is transported on said rail support system in a print cycle from a home position over said bed anvil to a terminous and return for imprinting a form from the print plate, the improvement of said rail support system for establishing the attitude and elevation of said platen with respect to said anvil, comprising:

a carriage transport rail having a first and a second end;

a first end mount for said first end of the transport rail;

a second end mount for said second end of the transport rail;

first and second means for movably supporting said first and second rail ends respectively for coordinated movement towards and away from said bed anvil simultaneously to a selected location;

a platen carriage mounted to run on said transport rail, said platen carriage slidably mounted and pivotal on said rail for establishing the guide path thereof, said platen carried by said carriage for travel in said print cycle, said platen thereby being adjusted in spacing with respect to said bed anvil for establishing proper print pressure of a form to be imprinted by a print plate on said bed anvil;

a guide rod for attitude control located a distance from said carriage transport rail and substantially parallel thereto said guide rod having a first and a second end;

a first end mount for said first end of the guide rod;

a second end mount for said second end of the guide rod;

means for adjusting the position of said mounts to shift said rod in a plane generally parallel to said anvil and normal to itself;

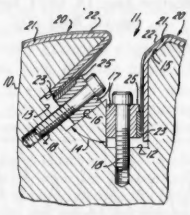
said platen carriage having guide surfaces closely fitting said guide rod in said normal direction whereby shifting of said end mounts of the guide rod will cause a rotation of said carriage about said transport rail for platen attitude control.

3,893,394

BLANKET CYLINDER SLOT ARRANGEMENT

Ralph L. Fusco, Commack, N.Y., and Burton D. Polglase, Plainfield, N.J., assignors to Wood Industries, Inc., Middlesex, N.J.

Filed Mar. 28, 1973, Ser. No. 345,508
Int. Cl. B41f *27/12*
U.S. Cl. 101—415.1 **5 Claims**



1. In a clamping and tightening arrangement for a flexible packing in a printing machine, said packing comprising a printing blanket having reinforced clamping edges and an underpacking, the improvement of said arrangement comprising in combination a rotatable blanket cylinder having at least two grooves each of said grooves having an opening in the periphery of said cylinder, said grooves axially extending the entire length of said cylinder, said grooves comprising two narrow slots of substantially rectangular section in the bottom thereof, the first one of said slots radially extending in said opening in the periphery of said cylinder, the second one of said slots disposed at an angle to said first slot and extending from said opening of said first slot in said periphery of said cylinder, said cylinder having a slanted edge on one side of said opening of said groove, said slanted edge having first and second rounded edges connected by a straight surface to form a contacting ramp, said slanted edge straight surface being substantially in line with the inside wall of said second slot such that said angle between said first and second slots is

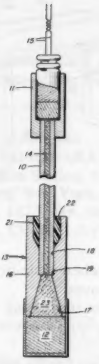
substantially equal to the angle formed between said slanted edge straight surface and said first radial slots, and a blanket clamping bar having a substantially rectangular section fitted together with said reinforced clamping edge of said blanket and with said underpacking in each one of said slots and means fastening said bar in said slot, said fastening means for each of said slots being substantially identical and interchangeable.

3,893,395

END COUPLER FOR HEAT RESISTANT MILD DETONATING FUSE

Earl E. Kilmer, College Park, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 26, 1965, Ser. No. 475,035
Int. Cl. C06c *5/06*
U.S. Cl. 102—27 R **10 Claims**



1. An end coupler for transmitting a detonation from a heat resistant mild detonating fuse to a base charge having a diameter greater than the diameter of the mild detonating fuse comprising,

an elongated housing,

said housing having a tapered recess formed in one end thereof,

said housing having an axial bore formed in the other end thereof and intersecting said tapered recess,

tapered recess being filled with hexanitrostilbene (Grade 1) explosive,

whereby a heat resistant mild detonating fuse may be inserted into said axial bore and a base charge may be positioned adjacent said one end of said housing so that said end coupler may amplify a shock wave produced by the mild detonating fuse to a magnitude necessary for the detonation of the base charge.

3,893,396

PARACHUTE-BORNE FLARE DEVICE

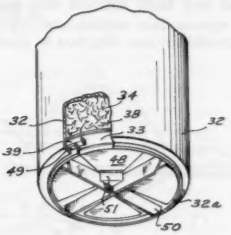
Björn Herman Olof Simmons, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Continuation-in-part of Ser. No. 93,995, Dec. 1, 1970, abandoned. This application Aug. 27, 1973, Ser. No. 391,760
Claims priority, application Sweden Dec. 3, 1969, 16623/69
Int. Cl. C06d *1/10*
U.S. Cl. 102—35 **16 Claims**

1. A parachute-borne flare device, said device comprising: an elongate body of a combustile flare composition;

a covering means covering the side wall and one end of said body to limit burning of the body to the area thereof exposed at the other end of the covering means, said one end of the covering being arranged for attachment to a parachute and the exposed area being the bottom area in the operational position of the device;

flare dividing means supported by the covering means at said exposed area of the body of the flare composition for dividing a single flare generated upon ignition of the body at said exposed area into partial flares, said dividing means including guide vanes downwardly extending in relation to said bottom area and circumferentially spaced about the center axis of said body, said vanes being canted radially outwardly



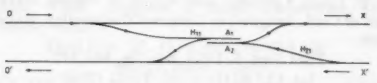
and curved to deflect partial flares radially outwardly to define a first angle β of 5° to 50° to said center axis and also to define a second angle $\gamma 2$ deflecting said partial flares into angular positions relative to each other and defining a gap between each two partial flares to allow passage of air therebetween and further defining an approximately linear pattern approximately normal to said center axis.

3,893,397

CONTINUOUS TRANSPORT SYSTEM FOR TRAINS WITH PROGRAMMED VEHICLES

Jean Gayot, Meudon, France, assignor to Engins Matra, Paris, France

Filed Feb. 26, 1974, Ser. No. 445,841
Claims priority, application France Feb. 28, 1973, 73-07199
Int. Cl. B61k *1/00*
U.S. Cl. 104—18 **3 Claims**



1. A track transport system for trains with programmed vehicles comprising a principal outward track and a principal return track, contiguous station platforms located between the tracks respectively for passengers leaving the outward and return trains, and respective connecting tracks of cissoid shape, one connecting track joining the outward track to the return track while servicing one of the passenger platforms and the other connecting track joining the return track to the outward track while servicing the other station platform, characterized in that each connecting track has a section enabling the train to approach its station platform from one direction while leaving the platform in the opposite direction.

3,893,398

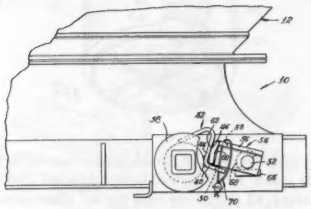
LOCK MEANS FOR SLIDE GATE OF HOPPER OUTLET ASSEMBLY

Robert T. Fischer, Homewood, Ill., assignor to Miner Enterprises Inc., Chicago, Ill.

Filed June 14, 1974, Ser. No. 479,217
Int. Cl. B61d *7/20*
U.S. Cl. 105—308 R **3 Claims**

1. For use in a hopper outlet assembly including a generally rectangular main frame having a front frame section and a rear frame section and side frame sections defining a discharge opening through which lading can flow by gravity, a generally rectangular gate slidably supported in the main frame, and a transverse operating shaft rotatably mounted in

the main frame adjacent the rear portion thereof for selectively moving the gate forwardly and rearwardly between open and closed positions relative to the discharge opening, lock means comprising a stop member secured to the operating shaft and presenting a bearing surface which faces rearwardly when the gate is in closed position, a transverse lock shaft rotatably mounted in the main frame parallel to the operating shaft rearwardly thereof, a radially extending lock hub unit secured to said lock shaft adjacent said stop member and presenting an arcuate cam surface, said lock hub unit normally being rotatable in one direction to pivot said cam surface into engagement with said bearing surface when the gate is in its fully closed position to block rotation of the operating shaft and movement of the gate away from its fully closed position, said lock hub unit being inactivated by rotation in the other direction to pivot said cam surface out of engagement with said bearing surface to permit rotation of the operating shaft and movement of the gate away from its closed position, and a radially extending follower arm secured to said lock shaft and being engageable with the underside of the gate when the latter is open whereby said lock hub unit is maintained inactivated until the gate is substantially closed.

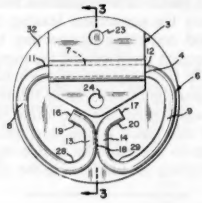


3,893,399

DUAL CARGO ANCHORING DEVICE

Dean F. Lewis, Lafayette, and Vearne D. Pinney, Hayward, both of Calif., assignors to Cargotrol Corporation, Hayward, Calif.

Filed Sept. 5, 1974, Ser. No. 503,377
Int. Cl.² B61D *45/00*; F16G *15/00*
U.S. Cl. 105—484 **5 Claims**



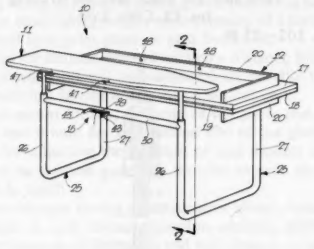
1. A dual cargo anchoring device for a cargo vehicle having sidewalls and frame members comprising:
   a. a hold-down clip having an elongated U-shaped portion and adapted for connection to said frame members of said vehicle;
   b. a B-shaped tie down member having:
      1. a straight portion for pivotal support between said U-shaped portion of said clip and said frame member,
      2. first and second curved portions integrally connected to opposite ends of said straight portions and curving inwardly with the portions adjacent the ends being connected as by welding,
      3. first and second end portions integrally connected to said first and second curved portions splaying away from each other and;
   c. means for attaching said clip to said frame members.

3,893,400

COMBINATION KITCHEN TABLE-IRONING BOARD

Philippe G. Grant, 1200 Alta Vista Dr., Ottawa, Ontario, Canada

Filed Mar. 25, 1974, Ser. No. 454,529
Claims priority, application Canada, Aug. 7, 1973, 178159
Int. Cl.² A47B *57/20*
U.S. Cl. 108—63 **2 Claims**



1. A combination kitchen table-ironing board comprising,
   a pair of table top leaves,
   two U-shaped tubular supporting members each having a ground-contacting cross bar with a pair of upwardly extending legs,
   one of said leaves being fixedly supported between a corresponding leg of each supporting member,
   an ironing board connected to a pair of tubular extensions, each extension being telescopically received in a corresponding one of the remaining legs of the supporting members whereby the ironing board is vertically movable between a first position below the level of said one of said leaves and a second, elevated position,
   a pair of movable abutments positioned to extend through holes formed in the extension receiving legs,
   the extensions being formed with a plurality of apertures therein whereby an abutment extends through a hole into an aperture thereby securing the extensions relative to the legs,
   the other of said leaves being hingedly connected to said fixedly supported leaf to cover and be supported by the ironing board in its first position.

3,893,401

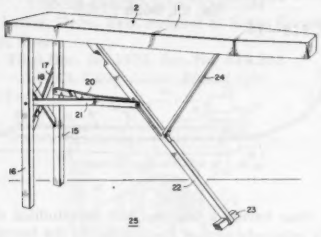
IRONING BOARD

James F. Casey, Woodside, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Aug. 12, 1974, Ser. No. 496,443
Int. Cl.² C09D *3/04*, *3/10*
U.S. Cl. 108—129 **1 Claim**

1. An ironing board, comprising
   a substantially elongated board-like member having a substantially planar upper surface for supporting articles to be ironed and a substantially planar under surface having a plurality of recesses formed therein; and
   a plurality of interconnected supporting strut-like members retractably accommodated in the recesses of the under surface of the board-like member in a manner whereby in one position of the strut-like members they extend away from the board-like member and cooperate with each other to support the board-like member in a substantially

horizontal plane spaced above a supporting surface and in another position of the strut-like members they are



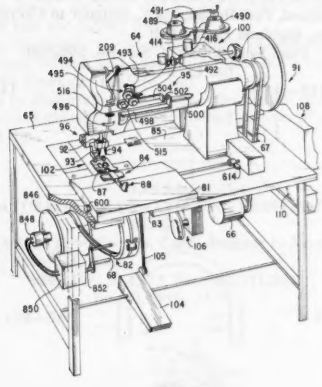
retracted into the recesses and present a substantially uniplanar under surface of the board-like member.

3,893,402

SEWING APPARATUS

Ronald J. Boser, Huntington Station, N.Y., assignor to B & W Manufacturing Co., Inc., New York, N.Y.

Filed Oct. 2, 1973, Ser. No. 402,876
Int. Cl. D05f *3/18*
U.S. Cl. 112—105 **24 Claims**



1. An apparatus for sewing a pair of tapes of a fastener chain to respective portions of an article having an opening between the portions which are joined at a terminal point at one end of the opening, the apparatus comprising

a pair of means each including a needle for forming stitches from a respective thread,

means for feeding the pair of tapes and the portions of the article through the pair of stitch forming means to form a pair of parallel spaced lines of stitches each fastening a tape to a respective portion,

manual control means for initiating operation of the pair of stitch forming means and the feeding means,

means for sensing the terminal point of the opening, and

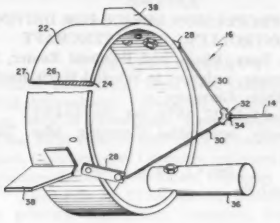
automatic control means responsive to the sensing means for terminating the operation of the pair of stitch forming means and the feeding means.

3,893,403

RING-SHAPED HYDROFOIL

Shelton M. Gay, Jr., Vienna, and Frederick C. Belen, Jr., Arlington, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 11, 1973, Ser. No. 405,358
Int. Cl.² B63B *21/56*
U.S. Cl. 114—235 B **2 Claims**



1. A hydrofoil for controlling the depth and lateral displacement of a cable being towed by a craft, comprising:

an annular ring having a thin radial cross section conducive to smooth flow and hydrodynamic lift presented edgewise to the slip stream having a blunt rounded leading edge, a tapered afterbody, and a sharp trailing edge;

a bridle attached adjacent to the leading edge of said annular ring at substantially diametrically opposed positions;

a tow-cable attached to said bridle intermediate the ends thereof; and

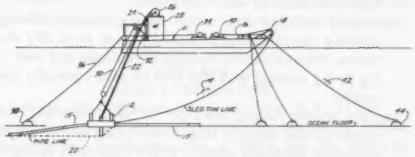
a ballast weight affixed to said annular ring.

3,893,404

PULL-AHEAD WINCH CONTROL SYSTEM

William R. Chandler, Sedro-Woolley, Wash.; Donald R. Cooper, North Hollywood, Calif., and Edward J. Mangold, Burlington, Wash., assignors to Skagit Corporation, Sedro-Woolley, Wash.

Filed Mar. 25, 1974, Ser. No. 454,506
Int. Cl. B63h *15/00*
U.S. Cl. 115—7 **9 Claims**



5. For use with a barge in which a trenching jet sled is suspended from the barge and is pulled by means of a sled cable, and the barge is moved by means of an anchored forwardly directed cable and a pull-ahead winch which winds in on said forwardly directed cable to impart forward movement to said barge, said pull-ahead winch being driven by means of a suitable prime mover and an electrically controlled clutch connected between said prime mover and said pull-ahead winch, a method of controlling tension in said sled cable comprising the steps of

1. sensing the tension in said cable sled and producing a first electrical signal responsive to said tension,
2. producing a second electrical signal representative of a desired tension,
3. modifying said first electrical signal by means of a second order lead-lag filter,
4. comparing said modified first electrical signal with said second electrical signal to produce an error signal,

5. producing a third electrical signal representative of velocity and direction of movement of said forwardly directed cable,
6. further modifying said error signal by comparing said error signal with said third electrical signal, and
7. amplifying said modified error signal and connecting said amplified, modified error signal to said electrically controlled clutch.

3,893,405

HYDRO-JET PROPULSION DEVICE FOR DRIVING AND CONTROLLING OF WATERCRAFT

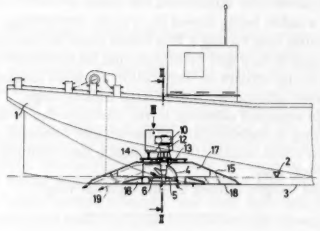
Siegfried Lais, Spay, Rhein, and Reinhold Reuter, Schwall, both of Germany, assignors to Schottel-Werft Josef Becker KG, Spay, Rhein, Germany

Filed Feb. 22, 1974, Ser. No. 444,912

Claims priority, application Germany, Mar. 28, 1973, 2315447

Int. Cl. B63h *11/04*

U.S. Cl. 115—12 R **5 Claims**



1. A hydro-jet propulsion device for driving and controlling shallow draught watercraft, comprising:

hull means;

means defining a conically shaped downwardly opening recess in a bottom surface of said hull means, the apex of said conically shaped recess being located above said bottom surface of said watercraft;

stationary annular ring means having means defining an opening therethrough mounted in said conically shaped recess, the axis of said annular ring means and said opening being coaxial with the axis of said conically shaped recess;

surface means facing inwardly of said conically shaped recess on said annular ring means being spaced from and extending generally parallel to the outwardly facing conical surface of said conically shaped recess whereby said spaced and parallel outwardly facing conical surface and said inwardly facing conical surface define a downwardly extending annular conically shaped passageway therebetween;

elbow means consisting of first and second hollow sections generally perpendicular to each other rotatably mounted in said conically shaped recess, said first hollow section being mounted coaxially with said conically shaped recess, said annular ring means and said opening through said annular ring means, said hollow second section communicating with the upper end of said annular conically shaped passageway; and

propeller pump means and drive means therefor, said propeller pump means being mounted in said elbow means for drawing in water through said opening in said annular ring means and into said first hollow section and ejecting water from said second section into said downwardly extending annular conically shaped passageway.

3,893,406

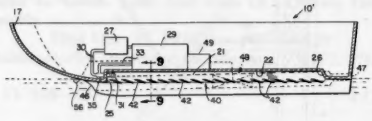
TWIN KEEL JET BOAT

Kermit H. Burgin, R.R. No. 1, Whitestown, Ind. 46075

Division of Ser. No. 329,061, Feb. 2, 1973, Pat. No. 3,811,398. This application Apr. 15, 1974, Ser. No. 460,714

Int. Cl. B63h *11/02*

U.S. Cl. 115—16 **7 Claims**



1. A boat having a bottom, twin longitudinal depending, laterally relatively narrow keels adjacent the lateral edges of said bottom and extending substantially throughout the length of said bottom, each said keel being formed to provide a passageway extending longitudinally therethrough and having at least one intake port adjacent its bow end and an exhaust port adjacent its stern end, a pump disposed in each said passageway intermediate its ends to draw water into said intake port and force it out through said exhaust port to propel said boat, an engine disposed in said boat, and means for drivingly connecting each said pump to said engine, each said keel being provided with a plurality of said intake ports in each of its depending side walls, each port being a longitudinally elongated, vertically narrow slot, said passageway being closed except for its intake ports and exhaust port.

3,893,407

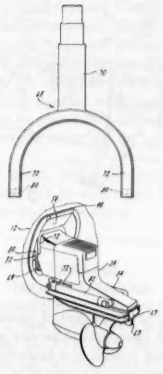
INBOARD-OUTBOARD MARINE DRIVE

John W. Hurst, Port Huron, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Sept. 23, 1974, Ser. No. 508,310

Int. Cl. B63h *5/12*

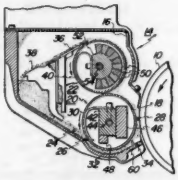
U.S. Cl. 115—41 R **11 Claims**



1. In an inboard-outboard marine drive unit for boats having an inboard engine connected to an outboard power leg through drive shaft means and universal joint means, the improvement comprising a yoke member having a generally upwardly extending center post directed oppositely from generally downwardly extending laterally spaced yoke arms, means pivotally mounting the power leg to the yoke arms about an axis to allow the power leg to be rotated upwardly and rearwardly for trimming, tilting and kick-up, and means pivotally connecting the upwardly extending center post of the

yoke to the boat about an axis to allow the yoke and power leg to rotate laterally for steering the boat.

3,893,408
TONER DISPENSING SYSTEM
Jerome E. Lamel, Plano, Tex., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 26, 1973, Ser. No. 428,592
Int. Cl. G03g 15/00; B05c 11/00
U.S. Cl. 118—7 2 Claims

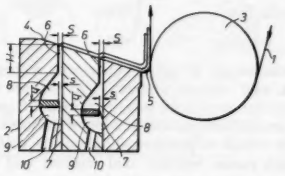


1. In a magnetic brush development system wherein a two-component developer, including conductive carrier particles and thermoplastic resinous toner particles adhering thereto tribo-electrically, is brought into contact with a photoreceptive surface to be developed under the effect of a magnetic field generated by a magnetic brush roller, the improvement comprising,
conducting means spaced from said magnetic brush roller by a predetermined gap through which the magnetically conveyed developer is passed,
means to bias the magnetic brush roller,
circuit means coupling said biased magnetic brush roller with said conducting means,
means responsive to shorts caused by undertoned carrier passing through said gap to determine the level of toner in the developer mixture, and
means to dispense additional toner into the developer mixture in response to a predetermined number of shorts per unit time.

3,893,409
APPARATUS FOR SOLDER COATING PRINTED CIRCUIT BOARDS
Everett Arthur Rote, Corona, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 1, 1972, Ser. No. 311,206
Int. Cl. B05c 11/12
U.S. Cl. 118—56 19 Claims

1. Apparatus for obtaining a uniform coating of solder on the conductive areas of a printed circuit board comprising:
a tank having a first pool of molten solder and a second pool of a substance that is less dense than said solder and immiscible therewith floated on top of said pool of molten solder and in contact therewith,
first means associated with said tank for contacting the conductive areas of said printed circuit board with molten solder from said first pool,
second means for moving said board downwardly past said first means to immerse said board in said second pool, and upwardly to remove board from said second pool, and
third means for vibrating said circuit board within said second pool in an orbital motion.

3,893,410
CASCADE COATER
Peter Herzhoff, Leverkusen; Hans Gref, Cologne; Fritz Maus, Odenthal-Hahnenberg; Wolfgang Schweicher; Hans Frenken, both of Leverkusen; Kurt Browatzki, Opladen; Karl Voss; Willi Wasser, both of Leverkusen, and Heinrich Bubmann, Opladen, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed July 30, 1973, Ser. No. 384,080
Claims priority, application Germany, Aug. 3, 1972, 2238133
Int. Cl.² B05C 3/02
U.S. Cl. 118—412 10 Claims

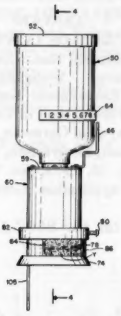


1. A cascade coater for coating sheet material, comprising a coating block extending over the entire sheet width with an inclined flow plane interrupted by a delivery gap for the delivery or each coating liquid, and a coating roller arranged at a short distance from the coating block over which the sheet to be coated is guided, wherein the delivery gaps open into a second pressure-distributing chamber which is connected to a first pressure-distributing chamber through a narrow connecting gap means, the cross section of the connecting gap means being small in relation to the cross section of the delivery gap.

3,893,411
YARN LUBRICATOR
Josef Krausz, 43-44 Kissena Blvd., Flushing, N.Y. 11355
Continuation-in-part of Ser. No. 346,076, March 29, 1973, abandoned. This application Aug. 2, 1974, Ser. No. 494,128
Int. Cl.² B05C 3/12
U.S. Cl. 118—420 4 Claims

1. A device adapted to function as an attachment for and to be mounted on yarn winding apparatus for lubricating a length of any one of a plurality of different traveling yarns having a non-continuous surface with a slow flowing viscous fluid having a fluidity of between 0.4 gr/min. to 10 gr/min., said device comprising:
a. an elongated housing having a passageway therethrough and a notch portion;
b. a container mounted on said housing, said container being adapted to hold a supply of the slow flowing fluid yarn lubricant;
c. orifice means for providing fluid flow communication between the interior of said container and said passageway means through housing;
d. a flange having a rigid surface extending radially from said housing with respect to the longitudinal axis thereof;
e. a non-absorbent, resilient partial wall fitting into the

notch in the housing, which partial wall serves as a continuation and completion of the housing to define in combination therewith an internal lubricating chamber, for receiving the lubricant from the passageway and for receiving the yarn said partial wall including a transverse surface that is parallel and in opposition to said rigid flange surface for defining a radial yarn path between it and said radially extending rigid flange surface for the yarn to enter and exit said chamber in a substantially tensionless manner and without passing through said



container and in any direction with respect to a vertical axis, said resilient wall acting to prevent leakage of the lubricant, to remove surplus lubricant from the yarn and to provide uniform distribution of the lubricant within the yarn which is positioned below the resilient wall and which passes between said resilient wall and said rigid flange surface with minimal functional contact; and

f. means for mounting said device on the yarn winding apparatus in a position such that the yarn lubricant flows from said container through said passageway means in said housing by gravity.

3,893,412

LIQUID APPLICATOR FOR A TRAVELING TEXTILE STRAND

James B. Louch; Hermann Buchert, and William Postman, all of Anderson, S.C., assignors to Dow Badische Company, Williamsburg, Va.

Filed July 19, 1974, Ser. No. 489,866
Int. Cl.[2] B05C *3/12*
U.S. Cl. 118—420 **5 Claims**

1. In a device for the application of a liquid treating composition to a traveling textile strand, the improvement therein for effecting the separate, simultaneous, precise, and uniform application of individual liquid components of the treating composition to the traveling textile strand, which improvement comprises the combination of:

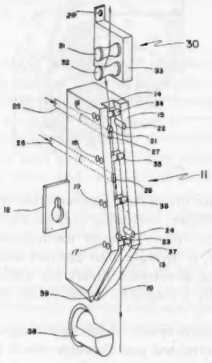
A. An elongated polyhedron having

1. An open applicator channel extending along the length of an elongated face of the polyhedron, the applicator channel having

a. Two end pins, each end pin being partially embedded in the body of the polyhedron at the bottom of the applicator channel and located in a transverse position therein in proximity to an end thereof;

b. One or more middle pins, partially embedded in the body of the polyhedron at the bottom of the applicator channel and positioned transversely therein, the middle pins being spaced from each other and the end pins, the exposed surfaces of the end pins and the middle pins being positioned so that a textile strand traveling through the applicator channel will make contact with each exposed surface; and

c. At least four guide pins, partially embedded in the body of the polyhedron and positioned normal to the longitudinal axis of the applicator channel, a guide pin being located on each side of the applicator channel in proximity to each end thereof, the exposed surfaces of the guide pins being positioned so that a textile strand passing through the applicator channel will contact the surfaces of the guide pins instead of the body of the polyhedron at the sides of the applicator channel; and



2. At least one means for the supply of a liquid component of the treating composition to the applicator channel at a controlled rate, each such means communicating with the applicator channel by means of a separate inlet orifice located at the bottom of the applicator channel a small distance above a middle pin; and

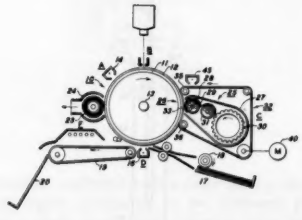
B. Guide means for aligning and directing the textile strand into the applicator channel and causing the textile strand to pass through the applicator channel in contact with the exposed surfaces of the end and middle pins.

3,893,413

XEROGRAPHIC DEVELOPING APPARATUS

Ernest A. H. Weiler, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 21, 1972, Ser. No. 291,111
Int. Cl. B05b *5/02;* **G03g** *13/06*
U.S. Cl. 118—637 **6 Claims**



1. Apparatus for developing a latent electrostatic image recorded upon the charged surface of a photosensitive plate including

means to apply charged particulate developer material to the image bearing plate surface whereby the latent electrostatic image recorded thereon is rendered visible, and

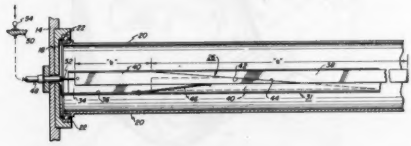
a foraminous shield interposed between the developing means and the plate, the shield being in contact with the imaged plate surface and being formed of a dielectric material having a triboelectric characteristic such that the shield is charged to a polarity similar to the polarity of the charged plate surface and a potential about the same as that of the background potential recorded on the plate surface.

3,893,414

METHOD AND APPARATUS FOR VARYING DEVELOPER BANDWIDTH

Frederick W. Hudson, West Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 29, 1974, Ser. No. 464,864
Int. Cl. G03g *13/08*
U.S. Cl. 118—637 **6 Claims**



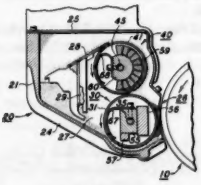
2. A copying machine comprising: a member having a developable image thereon, a developer sump containing developer therein having magnetic properties, means for transporting a bandwidth of the developer from said sump to the image for developing the same, said means comprising a rotatable non-magnetic member surrounding at least one magnetic member, said magnetic member being so constructed to vary in length, and means to selectively increase or decrease the length of said magnetic member to effect a corresponding change in the magnetic field emanating therefrom thereby effecting a corresponding change in the bandwidth of the developer transported to the image.

3,893,415

DEVELOPING APPARATUS

Raymond J. Ashton, Webster; Louis W. Reichart, and George J. Oriel, both of Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 199,481, Nov. 17, 1971, abandoned.
This application July 26, 1973, Ser. No. 382,996
Int. Cl. G03g *13/06*
U.S. Cl. 118—637 **17 Claims**



1. Apparatus for developing a latent electrostatic image that is recorded upon an image retaining plate including

a magnetic brush forming unit for establishing a brush like structure of developer material which is placed in operative communication with the image retaining plate within a developing zone,

means to move a flow of developer material into the developing zone,

a development electrode positioned within the development zone and being arranged to extend into the region wherein the developer material moves into said developing zone,

a conductive member complementary with the extended portion of the developing electrode and positioned adjacent thereto within the entrance region to the developing zone and being arranged to cooperate with the development electrode to provide a substantially enclosed flow path through which developer material passes as it enters said developing zone, and

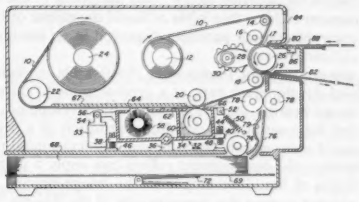
means to electrically bias the electrode and the conductive member to substantially the same potential to provide an electrically neutral flow path through which the developer material enters the developing zone.

3,893,416

DEVELOPMENT AND CLEANING APPARATUS FOR REVERSE PATH MACHINE

Roger H. Eichorn, deceased, late of Rochester, N.Y. (by Lincoln First Bank of Rochester, executor), assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 27, 1973, Ser. No. 429,005
Int. Cl. G03g *15/08*
U.S. Cl. 118—637 **11 Claims**



1. A copying apparatus comprising: a development station, a member having a developable image thereon, means for moving said image containing member in opposite directions through said development station, said development station comprising a developer housing having toner particles therein, development means located to present toner particles from said housing to the image in a developing operating position, and cleaning means for cleaning toner particles from said image member in a cleaning operating position, means for moving said development means into developing operation position to be in such position when said image member is moved in one direction therepast, and means for moving said cleaning member into cleaning operating position to be in such position when said image member is moved in the opposite direction therepast.

3,893,417

APPARATUS FOR LIQUID DEVELOPMENT OF ELECTROSTATIC IMAGES

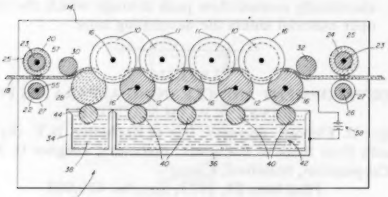
William C. York, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 17, 1974, Ser. No. 434,163
Int. Cl.[2] G03G *15/10*
U.S. Cl. 118—637 **2 Claims**

1. A development apparatus for developing latent electrostatic images borne on an image-bearing surface of a flexible medium during movement along a development path, said apparatus comprising:

a. a plurality of rotatable development rollers, located in horizontally spaced relation generally below the development path and having a diameter such that upper peripheral portions thereof define a generally horizontal lower side of the development path, each of said development rollers having a length which extends across the image bearing area but is shorter than the width of the flexible medium;

b. a plurality of guide rollers located in horizontally spaced relation generally above the development path and having a diameter such that lower peripheral portions thereof define a generally horizontal upper side of the development path, the axis of rotation of said quide rollers and said development rollers being offset along the direction of feed and spaced vertically so as define a horizontally, undulating development path which causes a flexible medium fed along said path to partially wrap around each development roller;



c. means for applying to the outer periphery of each development roller a thin layer of liquid developer of the type comprising toner particles dispersed in an insulating liquid carrier; and

d. drive means for transporting the flexible medium along said development path at a predetermined rate with the image-bearing surface facing said development rollers and for rotating said development rollers at a peripheral speed substantially equal to said predetermined rate;

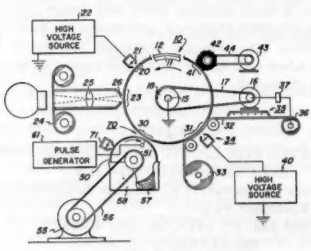
whereby said development rollers can apply a plurality of layers of liquid developer to the image-bearing surface without wetting the opposite side of the flexible medium with the liquid developer.

3,893,418

XEROGRAPHIC DEVELOPING APPARATUS

Alan J. Liebman, and Henry T. Chiavaroli, II, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 30, 1974, Ser. No. 474,743
Int. Cl. G03g *13/06*
U.S. Cl. 118—637 **9 Claims**



1. An apparatus for developing a latent electrostatic image recorded on an image retaining member comprising:

a. a donor member for supporting a uniform layer of electroscopic developing material adjacent to the image retaining member, said donor member and image retaining member being spatially disposed as to create a space gap between both members;

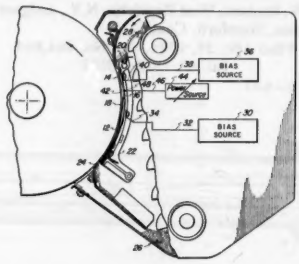
b. means to selectively introduce high and low frequency pulse biases across said gap, said pulses being comprised of an activation potential segment in which electroscopic particles are released from the donor member and a development potential segment of different polarity in which the electroscopic particles in non-image areas are attracted towards the donor thereby preventing particle deposition in the non-image areas.

3,893,419

BACKGROUND REDUCTION TECHNIQUE

Herbert L. Bresnick, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 26, 1973, Ser. No. 428,539
Int. Cl. G03g *15/08*
U.S. Cl. 118—637 **6 Claims**



4. In a xerographic development system wherein two component developer including, carrier granules and triboelectrically adhering toner particles, is cascaded down a photoconductive surface support latent electrostatic images to be developed, and wherein the surface is moved upwardly against the flow of two component developer, and wherein the lower portion of the development zone is provided with a low potential development electrode and wherein the upper portion of the development zone is provided with a high potential clean up electrode, the improvement comprising

means within the development zone to reduce the charge on the photoreceptor in non-image areas to thereby minimize the deposition of background toner in non-image areas.

3,893,420

METHOD FOR MASS SCALE REPRODUCTION OF PARASITIC INSECTS

Sergei Vasilievich Andreev, prospekt Stachek, 57, kv. 62, Leningrad; Mikhail Grigorievich Leibenzon, zavod 4, dom 6, kv. 6, Moskovskava oblast; Jury Petrovich Trushin, Dmitrovskoe shosse 43, kv. 212, Moscow, and Mikhail Sergeevich Luzgin, prospekt Mechnikova, 3, kv. 27, Leningrad, all of U.S.S.R.

Continuation of Ser. No. 294,783, Oct. 4, 1972, abandoned.
This application Oct. 25, 1973, Ser. No. 409,446
Int. Cl. A01k *67/00*
U.S. Cl. 119—1 **4 Claims**

1. A method for mass-producing parasitic insects consisting of infecting seeds of grain crops with eggs of a host-insect; transferring imagoes hatched from the eggs into an insect-duct by using phototaxis and to horizontal nets with a substrate and collecting host-eggs from the imagoes on the substrate; removing the host-eggs from the nets; the improvement comprising attaching host-eggs removed from the nets in strips to a severable band including means for dividing the band into uniform sections containing a determinable number of host-eggs; subjecting the host-eggs attached to the band to controlled cli-

matic conditions and infecting the host-eggs with eggs of parasitic insects; subjecting the parasitic insects during infection of the host-eggs to phototaxis to insure substantially complete infection of the host-eggs; and maintaining the infected host-eggs under climatic conditions normally encouraging birth of the parasitic insects in the infected host-eggs.

3,893,421

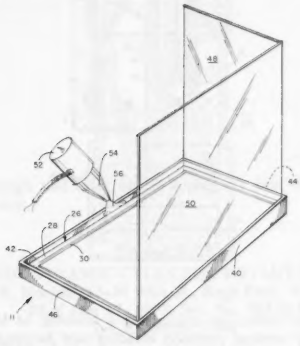
AQUARIUM AND METHOD OF FORMING THE SAME

Albert J. Dinnerstein, Brooklyn, N.Y., assignor to Metaframe Corporation, Elmwood Park, N.J.

Continuation-in-part of Ser. No. 307,540, Nov. 17, 1972, abandoned. This application June 25, 1973, Ser. No. 373,249

Int. Cl.[2] A01K *64/00*

U.S. Cl. 119—5 **5 Claims**



1. In the assembly of an aquarium having upper and lower molded, grooved thermoplastic frame members, the method comprising the steps of:

disposing a thermoplastic adhesive within the grooves of at least a lower frame member, said adhesive being capable of setting in approximately 30 seconds;

disposing the lower horizontal edge portions of a plurality of vertical glass panels within the grooves of said lower frame member before said adhesive sets, said vertical glass panels forming an enclosure closed about the lateral sides thereof;

adjusting said vertical glass panels so that adjacent vertical panels form corners at their junctures;

permitting said lower frame member and said adjusted vertical glass panels to remain undisturbed for approximately 30 seconds until said thermoplastic adhesive sets to thereby maintain said panels in their adjusted positions;

disposing a horizontal bottom glass panel on the bottom frame member contiguously with said vertical glass panels, each of said vertical glass panels forming a corner with said bottom glass panel; and

applying sealing means along all of said corners.

3,893,422

MILKING UNIT SUPPORT AND DETACHER MECHANISM

James J. Schnitzler; Gary W. Schluckbier, both of Madison, and Paul E. Krueger, McFarland, all of Wis., assignors to DEC International, Inc., Madison, Wis.

Filed May 10, 1974, Ser. No. 468,925

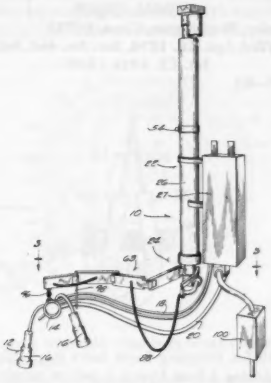
Int. Cl. A01j *5/04*

U.S. Cl. 119—14.08 **20 Claims**

1. A milking unit support and detacher mechanism comprising:

a main support assembly;

a horizontally extending retractable milking unit support assembly mounted on said main support assembly, said milker unit support assembly comprising a plurality of horizontally extending link members pivotally connected together in end-to-end relationship and adapted to support a milker unit on the outer end thereof when the milker unit is attached to a cow for milking, a flexible retract member fastened to one end to the end link member and threaded back through openings in at least two of



the other link members, and retract means for pulling on said flexible retract member to cause said link members to fold up on themselves which in turn will cause the milker unit to be retracted from underneath the cow; and a control means for automatically initiating the actuation of said retract means at a predetermined point in the milking cycle.

3,893,423

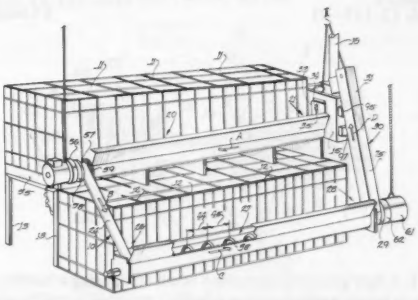
RECIRCULATING FEEDER

Eldon S. Hostetler, Middlebury, Ind., assignor to Chore-Time Equipment, Inc., Milford, Ind.

Filed Jan. 14, 1974, Ser. No. 433,147

Int. Cl. A01k *5/02*

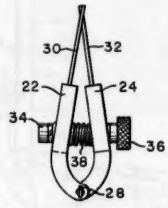
U.S. Cl. 119—52 AF **18 Claims**



1. A conveyor system for feeding poultry and the like, comprising an interconnected belt conveyor and auger conveyor, the belt conveyor including a housing having intake and discharge ends, an endless belt member mounted for cyclic motion between said ends and adapted to engage feed deposited at the intake end and transport the feed to the discharge end, and belt conveyor belt drive means mounted adjacent one opening for driving the belt in its cyclic motion, the auger conveyor including an auger member having a plurality of spiral flights for urging feed along the auger conveyor from an intake end to a discharge end and extending into the belt

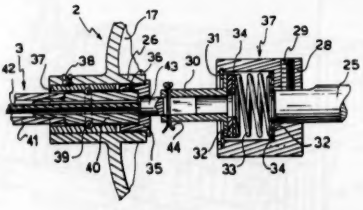
conveyor housing, and auger conveyor drive means for rotating the auger within the auger conveyor, and interconnector means including a shaft engaging both the auger conveyor auger and the belt conveyor belt drive means for common rotation and common operation from a single power source.

3,893,424
ANIMAL COMB
Mary C. Casler, Washington, Conn. 06793
Filed Apr. 26, 1974, Ser. No. 464,366
Int. Cl. A01k *13/00*
U.S. Cl. 119—83 **2 Claims**



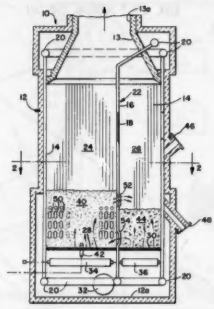
1. A comb for stripping loose hairs from the coat of an animal comprising a base having a pair of members hingedly connected together and each of said members being provided with spaced apart, straight and upstanding teeth, all of said teeth of one member being parallel and angularly directed in one direction and all of the teeth of the other member being parallel and angularly directed in the opposite direction, means for interconnecting said members to provide a plurality of adjacent pairs of teeth, the teeth of each pair crossing and contacting each other with a predetermined force, and means for adjusting one member relative to the other member to vary the predetermined force between said contacting teeth.

3,893,425
HAIR GROOMING MOTORIZED BRUSH
Jean-Claude Lapres, 803 Boucher St., Apt. 1, Montreal, Quebec, Canada
Filed Nov. 20, 1973, Ser. No. 417,537
Int. Cl.² A01K *13/00*
U.S. Cl. 119—91 **4 Claims**



1. A hair grooming motorized brush comprising a handle, a brush having a shank portion rotatably mounted in said handle and a brushing portion projecting outwardly from said handle, a motor, a flexible cable drive, said motor driving said brush through said flexible cable drive, said flexible cable drive having an outer tubular sheathing rotatably secured at one end to said handle for rotation of the latter relative to said tubular sheathing, and a friction clutch having a pair of coupling members connected to said flexible drive and to said motor respectively for rotation therewith and relative to each other, friction face means positioned between and in interengagement with said coupling members, spring means biasing said friction face means into said interengagement and one of said coupling members forming an external casing having the other coupling member displaceable therein and enclosing said friction face means and said spring means.

3,893,426
HEAT EXCHANGER UTILIZING ADJOINING FLUIDIZED BEDS
Richard W. Bryers, Cranford, N.J., assignor to Foster Wheeler Corporation, Livingston, N.J.
Filed Mar. 25, 1974, Ser. No. 454,045
Int. Cl.² F22B *1/02*
U.S. Cl. 122—4 D **15 Claims**

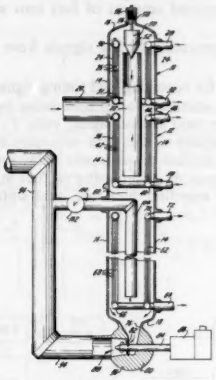


1. A heat exchanger comprising a housing, at least one substantially vertical partition dividing said housing into at least two adjoining chambers, means for establishing a bed of relatively coarse particulate fuel material in one of said chambers, means for establishing a bed of relatively fine particulate fuel material in the other chamber, and means to pass air through each of said beds to promote the combustion of said fuel material and maintain said chambers at predetermined temperatures, said partition being formed by a plurality of finned tubes for circulating a heat exchange medium in a heat exchange relation to said beds, portions of said tubes being bent in a manner to form a plurality of slots in said partition to communicate said chambers and permit circulation of portions of said fuel between said chambers.

3,893,427
GAS HEATED STEAM GENERATOR
Robert O. Barratt, Cedar Knolls, N.J., assignor to Foster Wheeler Corporation, Livingston, N.J.
Filed Sept. 16, 1974, Ser. No. 506,665
Int. Cl.² F22B *1/02*; F22G *1/00*
U.S. Cl. 122—32 **4 Claims**

1. A gas heated steam generator comprising:
a generally cylindrical shell closed at both ends;
a first reheater section adjacent one end of said shell;
a second reheater section axially spaced from said first heater section;
a central flow tube coaxial with and within said cylindrical shell and extending through said first reheater section and said second reheater section;
an evaporator spaced adjacent to the other end of said shell;
a gas inlet in said shell for allowing gas to flow between said first reheater section and said second reheater section and to divide into two streams one flowing upward over said first reheater section to said one end to reverse its direction and to flow down through said central flow tube, the other stream flowing downward over said second reheater section with said streams merging to flow over said evaporator-superheater section;
a gas outlet in the other end of said shell; and
an adjustable valve adjacent to said one end of said shell for

adjusting the rate of flow through said central flow tube to thereby control the portion of the gas coming in



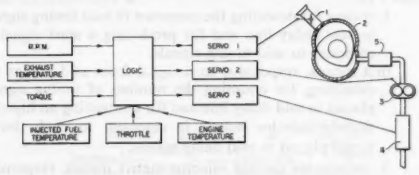
through said inlet which flows over said first reheater section.

3,893,428

THERMODYNAMIC CYCLE FOR ROTARY ENGINES

Isidoro N. Markus, 65-36 99th St., Rego Park, N.Y. 11374

Filed July 27, 1973, Ser. No. 383,067
Int. Cl. F02b *53/04*
U.S. Cl. 123—8.11 **3 Claims**



3. In an internal combustion engine wherein fuel from a supply is preheated before being injected into the internal combustion engine,

the combination of a fuel pump,

a thermoinsulated hydraulic restrictor comprising a block of ceramic having cold fuel inlet means and hot fuel outlet means,

said ceramic block having at least a fuel path,

said fuel path hydraulically connecting said fuel inlet means to said fuel outlet means,

said fuel being pumped along said fuel path by said fuel pump to frictionally increase its temperature prior to its introduction into a combustion chamber of said internal combustion engine.

3,893,429

STRATIFIED CHARGE ROTARY ENGINE WITH CARBURETOR FUEL CONTROL

Charles Jones, Hillsdale, N.J., assignor to Curtiss-Wright Corporation, 02, Wood-Ridge, N.J.

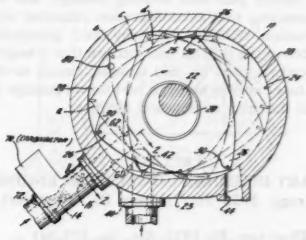
Filed Dec. 12, 1973, Ser. No. 426,663
Int. Cl. F02b *53/04*
U.S. Cl. 123—8.13 **5 Claims**

1. A rotary combustion engine comprising:

a. an outer body having a peripheral wall and axially-spaced side walls defining an internal cavity therebetween and also having first and second intake ports and an exhaust port opening into said cavity with the inner surface of said peripheral wall having a multi-lobe profile;

b. a shaft coaxial with said outer body cavity and having an eccentric portion;

c. an inner body of generally polygonal profile journaled on said eccentric portion for relative rotation within said outer body, the apex portions of said inner body having sealing cooperation with said peripheral surface to define a plurality of working chambers which vary in volume in response to said relative rotation and the communication



of said ports with said chambers being controlled by said relative rotation;

d. a passageway for supplying air only through said first intake port into said working chambers,

e. a passageway for supplying a fuel-rich mixture through said second intake port into said working chambers, and

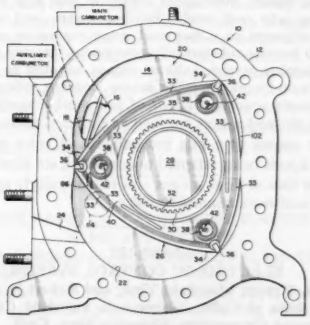
f. said two intake ports being so shaped and positioned that the first intake port opens to a working chamber before the second intake port and closes before the second port whereby the trailing portion of each working chamber is supplied with a relatively fuel-rich mixture.

3,893,430

COMBINATION SPARK PLUG AND PRECOMBUSTION CHAMBER FOR ROTARY ENGINE

Harvey A. Burley, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 30, 1973, Ser. No. 420,548
Int. Cl. F02b *53/04*
U.S. Cl. 123—8.13 **4 Claims**



1. A combination spark plug and precombustion chamber for a stratified charge rotary engine comprising in combination an engine housing including opposed end walls in conjunction with a central peripheral wall defining a rotor cavity, a rotor, an output shaft, an eccentric on said output shaft, said rotor planetating on said eccentric as it rotates within said cavity compressing a main relatively lean air fuel mixture supplied to the main combustion chamber on the peripheral wall of the said rotor, at least one precombustion chamber

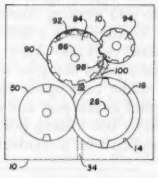
cavity formed in said rotor, an electrical contact secured to said rotor in said cavity, an engine ignition circuit, electrical circuit means connecting said contact with said ignition circuit, a liner defining a precombustion chamber, a spark plug secured in said liner forming a precombustion chamber and spark plug assembly, said assembly being positioned within said precombustion cavity in said rotor and being open to a peripheral surface of said rotor, an electrical contact on said spark plug engaging said rotor contact, said rotary engine housing having a passage sequentially and periodically supplying a rich air fuel mixture to said precombustion chamber as its opening rotates past said housing passage, and a throat passage connecting said precombustion chamber with said main combustion chamber whereby said precombustion chamber receives the rich air fuel mixture that is sequentially and periodically ignited by said ignition circuit so that the burning mixture expands through said throat passage igniting the charge in the main combustion chamber.

3,893,431

ROTARY INTERNAL COMBUSTION ENGINE

Oscar P. Gregg, 2928 Fort Henery Dr., Kingsport, Tenn. 37664

Filed Apr. 30, 1973, Ser. No. 355,341
Int. Cl. F02b *53/04*
U.S. Cl. 123—8.13 **7 Claims**



1. A rotary internal combustion engine comprising rotor means mounted in a cavity formed by internal side wall means of a block and internal end wall means of opposite heads, said rotor means being spaced from said side wall means over at least a substantial portion of its periphery to provide work chamber means, piston means on said rotor means adapted to extend outwardly from the periphery thereof to adjacent said side wall means, interrupter means in said side wall means extending into said work chamber means and adapted to remain adjacent to either said rotor means or said piston means to provide substantially continuous interruption of said work chamber means, exhaust means adapted to communicate with said work chamber means, conduit means connecting angularly spaced portions of said work chamber means, and fuel-air feed means for feeding fuel and air to said work chamber means at a rate independent of rotor speed, said conduit means being adapted to communicate simultaneously with said fuel-air feed means and said angularly spaced portions of said work chamber means.

3,893,432

ELECTRONIC CONTROL SYSTEM

David M. Krupp, Mountain View, and Robert B. Hood, Los Altos, both of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Dec. 30, 1971, Ser. No. 213,905
Int. Cl. F02b *3/00*
U.S. Cl. 123—32 EA **8 Claims**

1. An electronic control system for a fuel injection system for use with an engine producing repetitive signals for synchronizing the injection of fuel with the fuel requirements of said engine, which control system comprises:

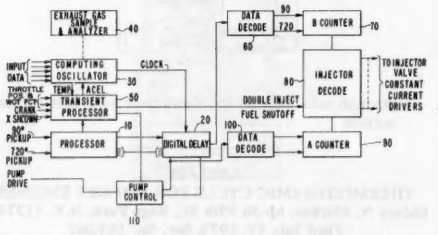
a. means for sensing the values of a plurality of parameters which determine the amount of fuel to be injected into utilization means of said engine, and for producing a plurality of first signals representing these values;

b. means, responsive to said first signals, for producing a second signal representing the injection time necessary to inject the required amount of fuel into said utilization means;

c. means for generating timing signals from the repetitive signals;

d. delay means for receiving said timing signals, said timing signals being shifted through said delay means at a rate determined by said second signal; and,

e. means, responsive to the time necessary for said timing signals to be shifted through said delay means, for controlling the opening and closing of fuel injection means disposed for injecting fuel into said utilization means comprising:



1. means for detecting the presence of said timing signals in said delay line and for producing a start signal in response to said timing signals;

firs' means, responsive to a signal from said means for detecting, for counting the number of timing signals placed in said delay line and for controlling an injector decode selector matrix in response to each timing signal placed in said delay means;

3. an injector decode selector matrix means, responsive to said first means for counting, for selecting a particular fuel injector means the opening and closing times of which are to be controlled by a corresponding timing signal travelling through the delay line; and,

4. second means for detecting and counting the timing signals arriving at the end of said delay means and for producing a signal in response to the arrival of each timing signal to control, through said injector decode selector matrix means, the closing of the fuel injector means opened by said timing signal.

3,893,433

ROTARY ENGINE WITH ROTATING CYLINDERS

Mihai C. Demetrescu, Irvine, Calif., assignor to Resonance Motors, Inc., Monrovia, Calif.

Filed July 2, 1973, Ser. No. 375,394
Int. Cl. F02b *53/00*
U.S. Cl. 123—45 A **14 Claims**

1. A gas-expansion engine comprising:

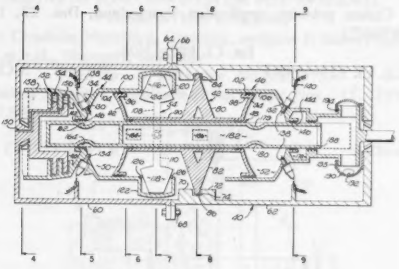
means defining expansion chamber means, including movable piston means for providing a reciprocal motion pattern upon expansion of gas in said chamber means;

means for expanding gas in said chamber means;

means for converting said reciprocal motion pattern of said piston means to revolve said means defining expansion chamber means;

force-displacement means for applying a force to said piston

means, which force is related and opposed to the reciprocating displacement of said piston means; and



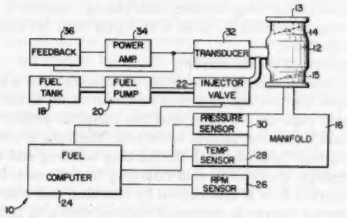
means for coupling said means defining expansion chamber means to provide mechanical rotary energy.

3,893,434

COMPUTER CONTROLLED SONIC FUEL SYSTEM

Arthur K. Thatcher, Merritt Island, and Ed R. McCarter, Maitland, both of Fla., assignors to Arthur K. Thatcher, Merritt Island, Fla.

Filed Sept. 29, 1972, Ser. No. 293,377
Int. Cl. F02b *33/00*
U.S. Cl. 123—119 R **41 Claims**



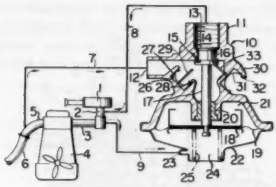
1. In an internal combustion engine having an intake manifold, an air source for providing an airstream for entry into said intake manifold and a fuel source for said internal combustion engine, a computer controlled sonic fuel system for providing fuel from said fuel source to the airstream entering the intake manifold comprising sonic transducer means having an active surface mounted for receiving fuel and providing a fuel dispersion to said airstream to cause a fuel-air dispersion to be present at the entrance to said intake manifold, fuel computer means connected to receive fuel from said fuel source and to provide a fuel output which varies as a function of variations in the operating condition of said internal combustion engine, and fuel input means for delivering the fuel output from said fuel computer means to the active surface of said sonic transducer means, said fuel computer means operating to maintain a substantially constant fuel-air ratio to said intake manifold for all operating conditions of said internal combustion engine.

3,893,435

EXHAUST GAS RECIRCULATION SYSTEM FOR AUTOMOBILE ENGINES

Toshiaki Konomi, and Hidetaka Nohira, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 14, 1973, Ser. No. 424,763
Claims priority, application Japan, Jan. 24, 1973, 48-9480
Int. Cl. F02m *25/06*
U.S. Cl. 123—119 A **7 Claims**



1. In an exhaust gas recirculation system for an automobile engine, comprising an exhaust gas recirculation conduit extending from an exhaust manifold to an intake system of the automobile engine for providing communication of engine exhaust gases between the manifold and carburetor, a flow control valve device disposed midway of said exhaust gas recirculation conduit for controlling the communication of the exhaust gases, said valve device having an intake vacuum chamber and including a valve element normally biased into a closing position of said valve device and movable in said valve device, when actuated, into an opening position of said valve device, an intake vacuum conduit extending from an intake manifold of the automobile engine to the intake vacuum chamber of said valve device for introducing an intake vacuum into said intake vacuum chamber, and actuating diaphragm means extending in said valve device for defining said intake vacuum chamber and connected to said valve element for actuating the same in response to a vacuum which is introduced from the intake manifold, the improvement comprising means including temperature responsive bistable metal spring means, responsive to the operating conditions of the automobile engine in terms of temperatures of both the atmospheric air and the exhaust gases both, for leaving the actuating action of said diaphragm means free only in the case where the temperature of the atmospheric air is higher than a first predetermined value and where the temperature of the exhaust gases is lower than a second predetermined value and for buckling in the remaining operating conditions of the automobile engine to render the actuating action of said diaphragm means inoperative so that said valve element may be held in the closing position even in the presence of the vacuum in the intake vacuum chamber of said valve device.

3,893,436

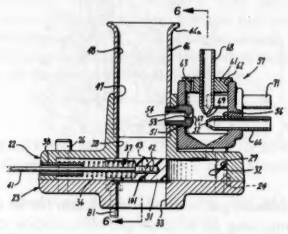
FUEL SUPPLY SYSTEM, CARBURETOR FOR USE IN THE SAME AND METHOD

William H. Beekhuis, Jr., 27686 Natoma Rd., Los Altos Hills, Calif. 94022

Continuation of Ser. No. 268,736, July 3, 1972, abandoned. This application May 13, 1974, Ser. No. 469,474
Int. Cl. F02m *7/10*
U.S. Cl. 123—119 R **30 Claims**

1. A fuel supply system for an internal combustion engine having at least one combustion chamber which is adapted to be placed in communication with an intake opening during each intake event, comprising wall means forming a wave tube having a substantially unimpeded flow passage with one end open to the atmosphere and with the other end adapted to be placed in communication with the intake opening of the internal combustion engine, means forming an orifice disposed in

the wall means forming the wave tube and opening into the flow passage of the wave tube, means for supplying fuel to the orifice so that the fuel has a level which will reach the orifice but will not flow through the orifice solely because of the level of the fuel with respect to the orifice, and throttle valve means disposed in the wave tube between the region in which the fuel is introduced into the wave tube and the intake opening, said throttle valve means being formed so that a shock wave from the engine can be propagated down the wave tube to cause fuel to be drawn into the wave tube through the orifice substantially solely during propagation of the pressure shock wave along the wave tube and to atomize the fuel so that the atomized fuel can be carried into the combustion chamber by the incoming air stream flowing in the wave tube, the pressure effect of said wave serving as substantially the sole means for metering fuel from the orifice, said wall means forming a wave tube including a body, said body being formed with shock wave terminating means for preventing a shock wave from traveling substantially more than one round trip in the flow passage in the wave tube for each intake event.



3,893,437

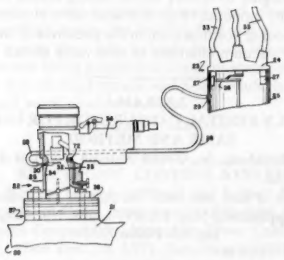
CARBURETOR SYSTEM

Gordon E. Ries, 4423 Third Ave., E., and Harley D. Johnson, 708 9th St., W., both of Bradenton, Fla. 33505

Filed May 3, 1972, Ser. No. 466,917

Int. Cl.[2] F02M 27/04

U.S. Cl. 123—119 E **7 Claims**



1. In an internal combustion engine, an intake manifold, a carburetor connected to said intake manifold, a distributor, and means for conveying ionized air from the distributor to said carburetor.

3,893,438

CAPACITOR IGNITION DEVICE FOR INTERNAL COMBUSTION ENGINES

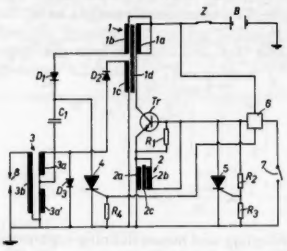
Rudolf Diener, Zurich, Switzerland, assignor to Autoelektronik AG, Chur, Switzerland

Filed Dec. 27, 1973, Ser. No. 428,710

Claims priority, application Switzerland, Dec. 22, 1972, 18786/72

Int. Cl. F02p 3/06

U.S. Cl. 123—148 E **3 Claims**



1. A capacitor ignition arrangement for an ignition combustion engine having spark plugs, comprising

an ignition transformer including primary winding means and a secondary winding connectable with each of the spark plugs;

a storage capacitor;

a thyristor having a control electrode;

means connecting together said thyristor to form a discharge path for said storage capacitor, discharging of the storage capacitor through said discharge path producing a high voltage firing pluse across the spark plug connected with the secondary winding of said ignition transformer;

a charging transformer having a pick-up winding and an outputwinding on a ferromagnetic core;

means connecting together said storage capacitor and said output-winding to form a charging path for said storage capacitor;

a source of direct current;

a transistor having an emitter, a collector, and a base;

means connecting in series said source of direct current, said pick-up winding, and the collector-emitter path of said transistor, so that when said transistor is conductive, current flows through the pick-up winding and electrical energy is stored in said charging transformer, and when current flow is interrupted by blocking said transistor the stored energy is delivered via said charging path to said storage capacitor;

a control pulse generator synchronized with said engine; and

a control circuitry responsive to control pulses delivered from said control pulse generator, said control circuitry including said transistor, switch-on means for triggering conductive said transistor with each control pulse, and cut-off means sensitive to the strength of the collector current of said transistor to block the transistor upon reaching a maximum collector current, and also having an output connected with the control electrode of said thyristor so that with each control pulse said thyristor is triggered conductive and a firing pulse is delivered,

wherein the charging transformer is equipped with an additional winding, said additional winding and the pick-up winding of said charging transformer forming a transducer which delivers electrical energy when current flows through said pick-up winding, and

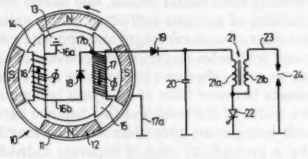
wherein said additional winding, a blocking diode and the primary winding means of the ignition transformer are connected in series, so that each firing pulse produced by

discharging of the storage capacitor is prolonged by an after-discharge of electrical energy delivered from said transducer.

3,893,439
MAGNETO IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Peter Chudoba, Nurnberg, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Nov. 8, 1973, Ser. No. 413,975
Claims priority, application Germany, Nov. 11, 1972, 2255396
Int. Cl. F02p *3/06*
U.S. Cl. 123—149 R **5 Claims**



1. A magneto ignition system for an internal combustion engine, comprising:

a capacitor;

a spark coil having its primary winding in circuit with a semiconductor switch and said capacitor and having its secondary winding in circuit with at least one spark plug of said engine;

means for closing said semiconductor switch at the desired ignition time for said engine to produce a spark;

said magneto generator having first and second armature windings positioned so as to be excited in phase synchronism, said first winding having a substantially larger number of turns than said second winding;

a first diode (**19**) connected between one end (**16b**) of said first winding (**16**) and said capacitor (**20**) for the charging of said capacitor by said generator; and

additional diode rectifying means (**18**) connected in series with said second armature winding (**17**), the series combination of said second armature winding (**17**) and said additional diode rectifying means (**18**) being connected in parallel with said first armature winding, said additional diode rectifying means being so poled that during a generated half-wave of polarity such that said first diode conducts, said second diode is blocked so long as the voltage across said first winding exceeds the voltage across said second winding.

3,893,440
AUTOMATIC DECOMPRESSION VALVE TO FACILITATE STARTING OF AN INTERNAL COMBUSTION ENGINE

James Linville Dooley, Santa Monica, Calif., assignor to McCulloch Corporation, Los Angeles, Calif.

Filed Oct. 26, 1972, Ser. No. 301,114
Int. Cl. F01l *13/08*
U.S. Cl. 123—182 **27 Claims**

1. An automatic decompression valve to facilitate starting of an internal combustion engine, said valve comprising:

housing means defining valve cylinder means and including:

gas inlet means for receiving compression gas from the cylinder of an internal combustion engine, and

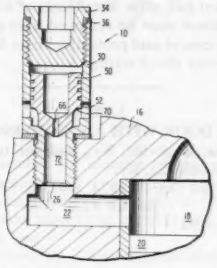
gas outlet means for venting compression gas from the cylinder of the internal combustion engine to effect decompression thereof;

valve piston means movable in said valve cylinder means between a valve closed position wherein said valve piston means is operable to block communication between said gas inlet means and said gas outlet means, and a valve open position wherein said valve piston means is operable to render said gas inlet means communicable with said gas outlet means;

said valve piston means including a valve opening reaction surface means and valve closing reaction surface means; said valve opening reaction surface means being responsive to pressurized gas entering said gas inlet means for producing a force on said piston means tending to move said piston means to said valve open position;

piston position control chamber means;

gas flow restriction means, including an orifice, for providing restricted fluid communication between said piston position control chamber means and pressurized gas entering said gas inlet means;



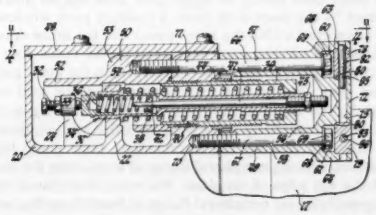
said valve closing reaction surface means being responsive to gas pressure in said piston position control chamber means for producing a force on said piston means tending to move said piston means to said valve closed position; said gas flow restriction means being operable to resist flow into said piston position control chamber means of gas entering said gas inlet means so as to maintain said valve piston means in said valve open position during initial cranking of the internal combustion engine; and

said gas flow restriction means being further operable to resist flow of gas out of said piston position control chamber means so as to maintain said piston means in said valve closed position during operation of the internal combustion engine after initial cranking.

3,893,441
TAMPER RESISTANT ENGINE GOVERNOR

Edwin E. Hebb, Jr., Dearborn, and Edward D. Baugh, Union Lake, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 31, 1974, Ser. No. 474,969
Int. Cl. F02f *7/00*
U.S. Cl. 123—195 C **3 Claims**



1. The combination in an internal combustion engine of:

an engine driven component having a housing,

an engine governor including a body mounted on said housing and having means for adjusting the governor speed settings,

a protective cover mounted on said governor body, said cover extending adjacent said component housing and enclosing said governor speed setting adjusting means,

means securing said cover to said governor body, said securing means being received in recesses in said cover, said recesses being formed in adjacent boss portions of said cover and one of said boss portions extending adjacent said component housing,

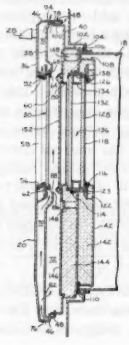
removable plugs closing said recesses and preventing removal of said securing means without removing said plugs, said plugs being retained by pins driven into openings through said plugs and boss portions, at least one of said openings having one end blocked by adjacency to said component housing, said one opening having its pin installed from its other end and removable only by driving out from said blocked end, whereby said protective cover may be installed after installation of said governor on said component but, after installation of said plugs and pins, said governor must be removed from said component in order to remove said protective cover for readjustment of the governor speed settings.

3,893,442

OVEN DOOR WITH AIR COOLING SYSTEM

James J. Nuss, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Oct. 3, 1974, Ser. No. 511,766
Int. Cl. F23n *7/00*
U.S. Cl. 126—198 **7 Claims**



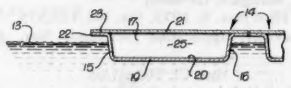
1. A windowed oven door comprising an outer door panel, intermediate door panel positioned behind and spaced from the outer door panel, an inner door liner and an inner panel carried by the inner door liner, a multiple pane window module supported within the inner panel and the inner door liner, at least one window pane supported by the outer door panel, thermal insulation means combined within the inner panel and inner door liner in the area surrounding the said window module, the said intermediate door panel having a window opening substantially coinciding with the said window panes for allowing viewing, the intermediate door panel having a rearwardly facing peripheral flange at least along the two sides and the top edge of the door, the outer door panel having a rearwardly facing peripheral flange at least along the two sides of the door which overlies the adjacent flange of the intermediate door panel, and air entrance openings arranged along the bottom edge of the door and air outlet openings arranged in the top portion of the peripheral flange of the intermediate door panel, whereby room air may pass up through the door passing both sides of the intermediate door panel before exiting from the top of the door.

3,893,443

FLOATING SOLAR POOL HEATER

Richard H. Smith, 30 Bater Rd., Hillsborough, Calif. 94010

Filed Jan. 11, 1973, Ser. No. 322,792
Int. Cl. E04n *3/19*
U.S. Cl. 126—271 **7 Claims**



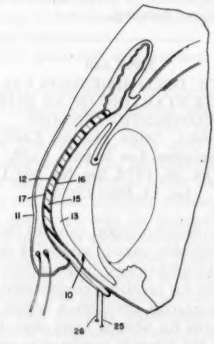
1. The combination of a pool of selected length and width and a floating solar heater means, said heater means comprising a plurality of separate individual heater units each having opposite sides of uniform length and opposite ends of uniform length and with sides and ends respectively of shape complementary to each other and to the sides and ends of the pool; the distance between sides of each unit being many times less than the width of the pool and the distance between ends of each unit being many times less than the length of the pool whereby a multiplicity of said separate individual units are used for the pool, each unit comprising a fixed side wall structure, a fixed bottom structure and a fixed top wall structure joined to form a relatively rigid shallow vessel with a chamber inside of uniform depth wherein air is at substantially ambient pressure, wall elements of the side wall structure comprising stiffening means, said top wall structure comprising a translucent sheet sealed at the edges to said sides and ends adjacent one edge of the side wall structure substantially closing said chamber, one of said wall structures having elements at sides and ends of each unit extending beyond the immediately adjacent wall structure whereby to provide mutual areas of abutment at sides and ends of adjacent units, there being a substantially closed air space between sides and ends of adjacent units.

3,893,444

NON-INVASIVELY MEASURING ARTERIAL OXYGEN TENSION

Irving Fatt, Berkeley, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

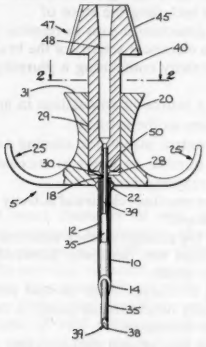
Continuation-in-part of Ser. No. 273,422, July 20, 1972, abandoned. This application Jan. 17, 1974, Ser. No. 434,191
Int. Cl. A61b *5/00*
U.S. Cl. 128—2 E **12 Claims**



1. A method for non-invasively determining continuous arterial oxygen tension of a patient, comprising the steps of

a. non-invasively measuring the palpebral conjunctival oxygen tension,
b. multiplying said tension by a constant dependent upon the relationship between the oxygen tension of the palpebral conjunctiva and the arterial oxygen tension of the patient, and
c. subtracting a second constant also dependent upon said relationship.

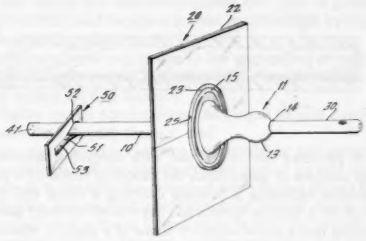
3,893,445
BONE MARROW BIOPSY INSTRUMENT
Paul W. Hofsess, Ridgefield, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.
Filed Jan. 9, 1974, Ser. No. 432,044
Int. Cl. A61b *10/00, 17/16*
U.S. Cl. 128—2 B **11 Claims**



1. A bone cutting component of a bone marrow biopsy apparatus including an alignment needle, which comprises;
a bone cutting assembly which comprises;
i. a handle for rotation; attached to a first end of
ii. a cylindrical shank having one end attached to said handle and the second end affixed to the proximal end of
iii. a cannula having an open distal end defining a bone cutting point which comprises a top rake primary grind of from about 18° to about 20° to the longitudinal axis of said cannula, a cutting edge at an angle of from about 25° to about 30° to a line perpendicular with the longitudinal axis of said cannula, said cutting edge being peripherally relieved; said shank and said cannula being adapted to be received within the bore of said alignment needle of the bone marrow biopsy apparatus.

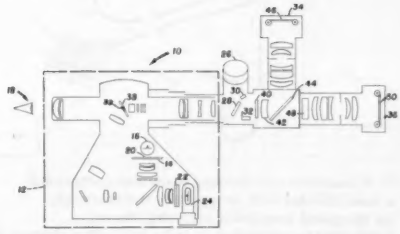
3,893,446
ABDOMINAL CATHETER AND SUPPORT COMBINATION FOR OPAQUE MEDIUM FLUIDS
Peter S. Miller, 125 C-2 15th St., Garden City, N.Y. 11530
Filed Apr. 8, 1974, Ser. No. 458,788
Int. Cl.² A61B *06/00;* **A61M** *25/02*
U.S. Cl. 128—2 A **1 Claim**

1. A catheter assembly comprising the combination of a catheter tube and a supporting member on said tube having a hollow nipple-like configuration comprising a bulbous tip with an opening flexibly and frictionally gripping said catheter tube;
said supporting member terminating in a radial flange having one face to engage the skin of a patient marginally about a body opening;
an adhesive patch having an aperture and said catheter tube passing therethrough with said aperture in generally axial alignment with the opening in said bulbous tip so that said catheter tube may pass through said patch aperture and through said bulbous tip opening into a body opening;
said adhesive patch marginally encompassing the opposite face of said flange and extending radially outward thereof for an area greater than the area of said flange and have adhesive thereon to adhere to the skin of a patient and to said opposite face of said flange to thereby secure said



supporting member for support of said catheter tube within a body opening;
wherein said catheter tube is adjustable to frictionally held positions in said supporting member and thereby in a body opening; and
whereby said bulbous tip aids securement of said supporting member in a body opening.

3,893,447
SIMULTANEOUS ANGIOGRAPHY OF THE SEPARATE RETINAL AND CHOROIDAL CIRCULATIONS
Bernard F. Hochheimer, Lineboro, and Robert W. Flower, Timonium, both of Md., assignors to The Johns Hopkins University, Baltimore, Md.
Filed June 4, 1973, Ser. No. 366,408
Int. Cl.² A61B *5/00*
U.S. Cl. 128—2 A **11 Claims**

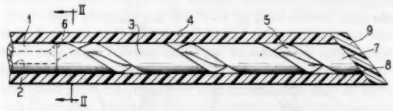


1. A method for the simultaneous angiography of the separate retinal and choroidal circulations of the eye, comprising the steps of:
injecting a mixture of substances into the circulatory blood system of the human body, the substances of the mixture transmitting electromagnetic radiation in different portions of the electromagnetic spectrum;
irradiating the eye with electromagnetic radiation;
splitting the electromagnetic radiation transmitted from the eye into at least two components having different wavelength ranges; and,
recording the separate radiation components independently of each other.

3,893,448
CATHETER DEVICE FOR USE IN DETECTING GAS IN BODY FLUIDS AND TISSUE

John W. Brantigan, 914 Medical Plaza, Salt Lake City, Utah 84112

Filed Nov. 26, 1973, Ser. No. 419,109
Int. Cl. A61b *05/00*
U.S. Cl. 128—2 G 10 Claims



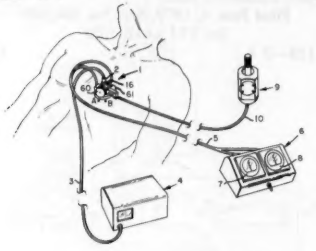
1. A catheter device for use with analyzing apparatus to obtain samples of gases from the blood or tissue of a patient, said device including a cannula carrying a distal end portion covered by a tubular membrane permeable to body gases and insertable into a blood vessel or tissue of a patient, wherein the improvement comprises:

said distal end portion being solid throughout its length, and said solid end portion being shaped to provide a path for gases between its external surface and said membrane covering it leading to the lumen of said cannula.

3,893,449
REFERENCE APPARATUS FOR MEDICAL ULTRASONIC TRANSDUCER

Robert D. Lee, San Mateo; Robert J. Hudock, and Dale I. Shute, both of San Jose, all of Calif., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 21, 1973, Ser. No. 427,395
Int. Cl. A61b *10/00*
U.S. Cl. 128—2 V 5 Claims



1. A transducer positioning apparatus comprising:

a base member with an aperture therethrough;

an elongated transducer receiving sleeve;

a ball joint including a seat, and a ball with a channel therethrough, said seat being fastened to said base member around the periphery of said aperture, said sleeve being secured about its midsection to the channel wall of said ball whereby said sleeve may swivel in two orthogonal directions about a point inside said sleeve;

first and second U-shaped yokes each having a slotted midsection, said slotted midsections being located over said aperture;

means for pivotably mounting the extremities of said yokes to said base member so that said yokes are orthogonally disposed to each other and said sleeve slidably engages the slotted midsection of each yoke;

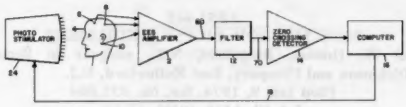
means coupled to said yokes for remotely moving said yokes; and

means for remotely indicating the orientation of said transducer receiving sleeve with respect to said base member.

3,893,450
METHOD AND APPARATUS FOR BRAIN WAVEFORM EXAMINATION

John P. Ertl, 15 Linden Ter., Ottawa, Canada

Filed Oct. 9, 1973, Ser. No. 404,669
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.1 B 8 Claims



1. A method of determining the response of a subject to an external stimulus including the steps of

a. positioning detection means in relation to a subject and detecting the electrical activity of the brain of the subject, said brain activity comprising a plurality of brain waveforms,

b. positioning a source of stimulation in an operative position in relation to the subject,

c. providing control means for causing said source to be activated a number of times in succession to provid a plurality of subject stimuli,

d. obtaining the resultant electrical activity by means of said detection means,

e. determining the passage of each resultant brain waveform through at least one particular selected mathematically determinable point,

f. determining a characteristic of said particular selected mathematically determinable point in the respective resultant brain waveform,

g. obtaining the sum of said characteristic for said plurality of subject stimuli,

h. effectively dividing said sum of characteristics by the number of said stimuli and providing an indication of the average value of said characteristic,

i. wherein said characteristic is the time interval between activation of said course of stimulation and the second falling zero crossing of the brain waveform, said average value being identified as the A score of the subject, and including the steps of obtaining the sum of the time intervals from the activation of said source of stimulation and the third falling zero crossing and effectively dividing the latter sum by the number of stimuli to provide an average value of the third falling zero crossings identified as the B score, said A score and said B score being utilized to indicate the condition of the subject, and

j. indicating the condition of the subject as represented by said A score and B score.

3,893,451
PRESSURE TRANSMISSION DEVICE

Herve Durand, 12 rue Jean Jaures, 95600 Eaubonne, France, and Theo Grandjean, 31 rue Rumine, 1011 Lausanne, Switzerland

Filed Oct. 10, 1973, Ser. No. 405,049
Claims priority, application France, Oct. 11, 1972, 72.36033
Int. Cl.[2] A61B *5/02*
U.S. Cl. 128—2.05 D 11 Claims

1. In a device for use in measuring blood characteristics, particularly blood pressure or the like, having a catheter tube for insertion into the blood stream of a body and a transducer apparatus for picking up and converting pressure variations into proportional electrical voltage variations susceptible of measurement, a combination comprising a pressure transmission tube having two spaced end portions and adapted to be filled with a substantially immobile liquid pressure transmission medium, said end portions respectively communicating

with said catheter tube and said transducer, and said pressure transmission tube defining an internal passage free of turbulence-producing projections and composed of at least two communicating main sections, one of said main sections having a constant inner diameter of between 0.5 and 2.5 mm and having a first self-resonant frequency, and the other of said main sections having a second self-resonant frequency and being of narrower diameter than said one main section and having a constant inner diameter of between 10 through 85

percent of said inner diameter of said one main section, whereby the self-resonant frequencies of said catheter tube and said pressure transmission tube are shifted away from the frequencies of the pressure variation signals to be measured so as to provide error-free measurement of the latter; and joining means forming a continuous internal channel located intermediate said sections of said pressure transmission tube and communicating with said internal passage so as to accommodate said liquid medium therein in a non-turbulent manner.

3,893,452

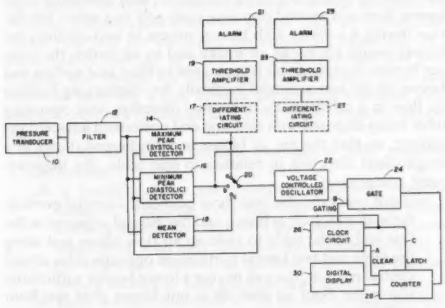
BLOOD PRESSURE MONITORING SYSTEM

Michael R. Birnbaum, New Brighton, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed July 9, 1974, Ser. No. 486,855

Int. Cl. A61b *5/02*

U.S. Cl. 128—2.05 A **11 Claims**



1. A system for monitoring the blood pressure of a patient, said system comprising:

a. transducer means adapted to be coupled to the arterial system of the patient for providing an output indicative of the patient's blood pressure;

b. detector means for sampling the output of said transducer means to detect and to store the maximum and minimum magnitudes of the transducer means output within a predetermined period and to provide first and second outputs indicative thereof, said detector means responsive to a reset signal to remove the stored magnitudes in preparation for sampling the next portion of said transducer means output;

c. oscillator means responsive to one of the first and second outputs of said detector means for providing a train of pulses whose frequency is dependent upon the magnitude of the one output of said detector means;

d. gate means for selectively gating the train of pulses derived from said oscillator means therethrough in response to a gating pulse signal;

e. counter means responsive to the gated train of pulses for providing an output indicative of the number of the train of pulses applied thereto;

f. display means for receiving the output of said counter to provide a display thereof; and

g. free-running clock means for providing and applying a latch signal of the predetermined period to said counter means to transfer the output of said counter means to said display means, the predetermined period being set in accordance with the lowest pulse beat of the patient to be monitored by said system, and for providing and applying the gating pulse signal of the predetermined period to said gate means to gate the passage of the oscillator means output to said counter means, the pulsewidth of the gating pulse signal being sufficient to permit said oscillator means to generate a number of pulses corresponding to the highest blood pressure of interest, the periodic latch signal also being applied to said detector means whereby the stored minimum and maximum magntidues are removed from said detector means.

3,893,453

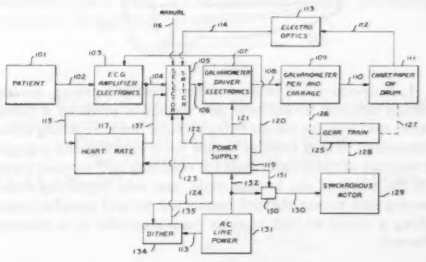
COMPRESSED DATA DISPLAY SYSTEM

Herbert E. Goldberg, Concord, and Robert L. Cannon, Waltham, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Feb. 11, 1974, Ser. No. 441,684

Int. Cl. A61b *5/04*

U.S. Cl. 128—2.06 G **40 Claims**

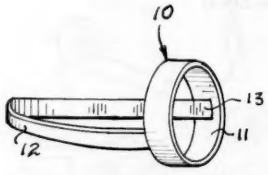


16. A system for displaying vital signs of a patient, said system comprising means for sensing said vital signs and for providing analogous electrical signals, supporting means, a looped markable surface supported by said supporting means, means for advancing and recycling said surface about a first axis, and marking means responsive to said signals for coating said surface with representations of said signals in a helical path about said axis.

3,893,454
INSTRUMENT FOR USE IN CONIOTOMY
Karl Wilhelm Hagelin, Backvagen, Sweden, assignor to Aktiebolaget Stille-Werner, Stockholm, Sweden
Filed Feb. 6, 1974, Ser. No. 440,121
Claims priority, application Sweden, Dec. 4, 1973, 7316352
Int. Cl. A61b 17/24
U.S. Cl. 128—17 8 Claims

1. An instrument for use in coniotomy, comprising:
a. a speculum portion including blades jointly defining an air flow passage extending between an outer and an inner end thereof; and
b. a knife unit having a blade movably introducible through said air flow passage and so advanceable that the point of the blade can protrude from said inner end of said speculum portion;
whereby said speculum portion provides guidance for said knife unit, and whereby said air-flow passage becomes unrestricted in response to retraction of said knife unit.

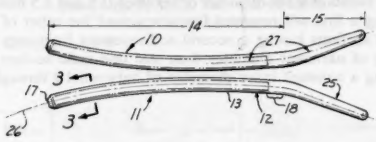
3,893,455
MALE RETAINING DEVICE
Aubrey D. McNally, 1136 N. Grimes, McPherson, Kans. 67460
Filed July 16, 1971, Ser. No. 163,384
Int. Cl. A61f 5/00
U.S. Cl. 128—79 1 Claim



1. A device of the character described comprising, annulus means adapted to encircle and engage a penis of a human male, said annulus means being circular, and breeching means connected to said annulus means for encircling and engaging a scrotum of the human male for retaining said annulus means on the penis of the human male, and said breeching means having end means thereof connected to said annulus means along a chord of said annulus means parallel to a diameter thereof.

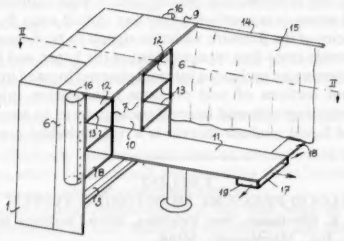
3,893,456
PENILE PROSTHESIS
Michael P. Small, Miami Lakes, Fla., and James E. Cox, Goleta, Calif., assignors to Heyer-Schulte Corporation, Goleta, Calif., by said James E. Cox
Filed Aug. 7, 1974, Ser. No. 495,315
Int. Cl. A61f 5/00
U.S. Cl. 128—79 20 Claims

1. A prosthesis for implantation in the penis to provide a flaccid penis with rigidified dimensions of length and width and with the property of flexural stiffness, said prosthesis comprising a one-piece member which includes a composite rod having a dimension of axial length and, for the major proportion of its length, comprising two physically distinct bodies that are integrally joined to each other, one of which



is more resistant to bending and to compressive deformation than the other, and a prong extending from said rod, said prong decreasing in lateral cross-section as it extends away from the rod, one of the bodies being stiffly flexible.

3,893,457
GERM-FREE OPERATING TABLE
Dirk van der Waaij, Voorburg, Netherlands, assignor to Pielkenrood-Vinitex N.V., Assendelft, Netherlands
Filed June 16, 1972, Ser. No. 263,587
Claims priority, application Netherlands, June 17, 1971, 7108371; Dec. 10, 1971, 7116954
Int. Cl. A61g 7/04, 13/00
U.S. Cl. 128—132 R 7 Claims



1. A device for providing germ-free air flow above an operating table on which a patient is to be placed who is to be isolated as to air from the environment of the table and from the room in which the table is located, said operating table having first and second opposite ends and two sides, the device having a cabinet with blower means in said cabinet, the blower means having an air intake and an air outlet, the cabinet further containing air filter means to filter said airflow and having an air exit arranged vertically for discharging laminar air flow in a substantially horizontal direction, said operating table being disposed with said first end positioned adjacent the cabinet, so that the air, as blown and discharged, flows in a longitudinal direction in relation to said table, the improvement comprising:
said exit being divided into three portions; a central portion, through which air is blown and discharged adjacent to the first end of the table to yield an air flow above and along the table and two lateral portions on opposite sides of said central portion, the exit having a lower border sufficiently above the floor so that air is not blown over the floor surface;
each of said two lateral portions having outwardly extending baffle portions on both sides thereof to direct air laterally and alongside said table into the area occupied by a person or persons standing at the sides of said table;
the air intake for the blower means disposed below the exit to suck air from underneath said table, thereby creating a low pressure region under the flow along the underside of the table; curtains extending from the outwardly extending baffle portions located farthest from the operat-

ing table, along said table, said curtains being suspended from guides extending from the upper portions of said baffles, the curtains having lower edges ending above the floor, but below the table, so that the air blown from the lateral exit portions flows along the curtains and is confined therewith;

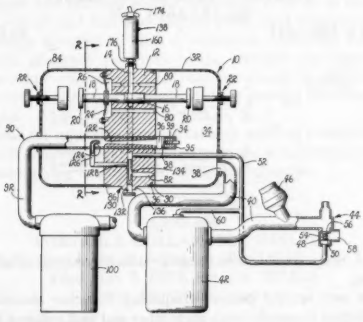
the blower means being capable of providing substantially horizontal air flow over the whole length of the table when the air is discharged from the central as well as the lateral portions of the exit; and means defining additional discharge means connected to receive germ free air from said blower and having first discharge means adjacent the second end of the table opposite the cabinet for blowing air laterally away from the table, transverse to said longitudinal direction.

3,893,458

HEAT STERILIZABLE PATIENT VENTILATOR

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Alexander S. Irons, La Canada; Paul P. Muehter, Tujunga, and Willie D. Kent, Los Angeles, all of Calif.

Filed Mar. 7, 1974, Ser. No. 449,153
Int. Cl. A61m *16/00*
U.S. Cl. 128—145.8 **6 Claims**



1. In a heat-sterilizable patient ventilator of the type including a ported center-body having means defining a circumscribing annular shoulder, a shell mounted on said shoulder for defining in juxtaposition with the center-body an hermetically sealed reservoir for confining gas consisting essentially of a bacteria-free mixture of ambient atmospheric gas and pure oxygen, and means for discharging said mixture from said reservoir including a first tubular gas conduit extended from said reservoir to a discharge fitting, the improvement comprising:

means for delivering bacteria-free gas to said reservoir including,

A. a second tubular gas conduit of relatively constant diameter extending from said reservoir having means defining at one end thereof a gas discharge port communicating with said reservoir and means defining at the other end thereof an ambient gas intake port remotely related to said gas discharge port;

B. filter means connected to the second tubular gas conduit at the said other end thereof for substantially sealing said ambient gas intake port against entry of microorganisms including:

1. a filter housing,

2. a dust filtration unit seated in said housing formed of Scott filter foam,

3. a microbial filtration unit seated in said housing in juxtaposition with said dust filter unit including a plurality of screen-supported bacterial retentive pads formed of FM-004 fiberglass filter material, and

4. a media migration filtration unit seated in said housing in juxtaposition with said microbial filtration unit formed of Scott filter foam; and

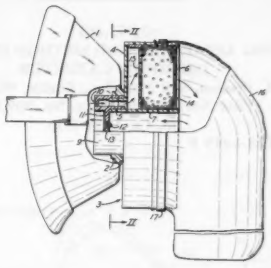
C. means including a gas jet coaxially related to said second tubular gas conduit for discharging into the second conduit a stream of gas consisting essentially of pure oxygen.

3,893,459

EMERGENCY BREATHING APPARATUS

John W. Mausteller, Evans City, and Miles J. McGoff, Warrendale, both of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Mar. 4, 1974, Ser. No. 447,855
Int. Cl. A61m *15/00*
U.S. Cl. 128—191 R **4 Claims**



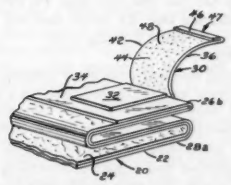
1. Emergency breathing apparatus comprising a mask member having an open inner side, a closed outer side and provided with a breathing opening in said outer side, a chemical cartridge member secured to the mask member, the cartridge member having an exhalation passage extending therethrough registering with said breathing opening, a carbon dioxide removing and oxygen generating chemical in said exhalation passage, a breathing bag provided with an opening receiving said mask member with said cartridge member inside the bag, said bag being sealed against the mask member about the periphery of said opening whereby the mask member supports the bag, one of said members being provided with an inhalation passage by-passing said chemical for connecting the inside of the bag with the inside of the mask member, and an inhalation check valve in said inhalation passage preventing exhalation through that passage.

3,893,460

DIAPER TAPE FASTENER

Hamzeh Karami, Crystal Lake, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed May 23, 1974, Ser. No. 472,530
Int. Cl. A61f *13/16;* **A41b** *13/02*
U.S. Cl. 128—287 **14 Claims**



1. A tape fastener for a disposable diaper having front and back surfaces facing toward and away from an infant, respectively, after placement of the diaper, said fastener comprising:

a release sheet secured to the front surface of the diaper adjacent a side edge of the diaper; and

a pressure-sensitive tape strip extending around the side edge of the diaper, said strip having a first end section secured to the back surface of the diaper, and a second end section having a securement portion releasably attached to said release sheet, and tab means adjacent the outer end of said securement portion relative the side edge of the diaper and having an adhesive free surface portion facing the front surface of the diaper to provide for easy removal of the securement portion from said release sheet, said tab means comprising a strip of material covering at least a portion of adhesive adjacent the outer end of the second end section, and including means for releasably retaining said tab means adjacent a surface of said diaper.

3,893,461

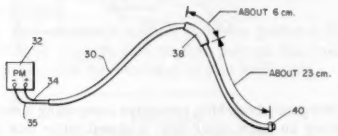
PACING APPARATUS AND METHOD UTILIZING IMPROVED CATHETER

Thomas A. Preston, 820 37th Ave., Seattle, Wash. 98122

Filed Nov. 28, 1972, Ser. No. 309,996

Int. Cl. A61n 1/36

U.S. Cl. 128—419 P **23 Claims**



10. A method of artificially pacing a human patient comprising periodically generating outside of said patient electrical pacing signals, positioning a first electrode at a first position within said patient's heart and a second electrode at a second position within said patient's vascular system but outside of said patient's heart, transmitting said signals into said patient and connecting them to said electrodes with said signals being negative at said first position with respect to said second position.

3,893,462

BIOELECTROCHEMICAL REGENERATOR AND STIMULATOR DEVICES AND METHODS FOR APPLYING ELECTRICAL ENERGY TO CELLS AND/OR TISSUE IN A LIVING BODY

Michael R. Manning, Philadelphia, Pa., assignor to ESB Incorporated, Philadelphia, Pa.

Continuation-in-part of Ser. Nos. 221,653, Jan. 28, 1972, abandoned, and Ser. No. 290,391, Sept. 19, 1972, abandoned.

This application Dec. 22, 1972, Ser. No. 315,901

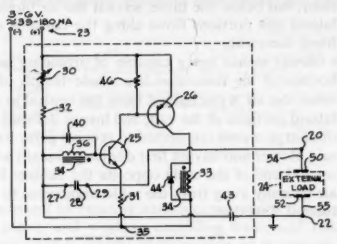
Int. Cl. A61n 1/36

U.S. Cl. 128—421 **30 Claims**

1. An electrical medical device for artificially stimulating normal bone growth and repair processes in a predetermined zone of a living body by modifying the electrical potential of the predetermined zone of the living body comprising:

a. means for generating an electrical signal undulating in both the positive and negative directions and having a wave-form whose rise time is different from its fall time; and

b. means for reactively coupling said signal to said predetermined zone of said living body and for effecting a voltage in said predetermined zone undulating both in the positive and negative directions with the maximum amplitude of said voltage in one direction being greater than the maximum amplitude of said voltage in the opposite direction thereby to artificially stimulate normal bone growth and repair processes in said predetermined zone.



3,893,463

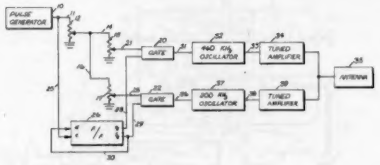
DUAL CHANNEL STIMULATOR

Terrell M. Williams, Minneapolis, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Dec. 7, 1973, Ser. No. 422,897

Int. Cl.[2] A61N 1/36

U.S. Cl. 128—421 **10 Claims**



1. A body implantable receiver which comprises: antenna means;

first and second passive frequency detector means connected in parallel with each other and said antenna means for resonating with said antenna means at a first and a second frequency, respectively;

dual channel output means including active output electrode means in each channel; and

means interconnecting said passive frequency detector means and said dual channel output means for isolating each output means channel from signals produced by resonance at a different one of said first and second frequencies.

3,893,464

TOBACCO COMPOSITION

Vello Norman, and Herman G. Bryant, Jr., both of Durham, N.C., assignors to Liggett & Myers Incorporated, Durham, N.C.

Filed Dec. 19, 1973, Ser. No. 426,114

Int. Cl. A24b 15/02

U.S. Cl. 131—17 R **8 Claims**

1. A smoking composition comprising:

a. tobacco;

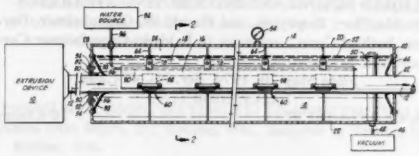
b. finally divided zinc oxide in a catalytic amount of from about 0.1 to about 15 weight percent sufficient to reduce the amount of polycyclic aromatic compounds in tobacco smoke; and

c. a nitrate of calcium, magnesium or zinc in an amount of from about 0.25 to about 0.75 weight percent calculated as nitrate nitrogen, based upon the weight of said tobacco, said amount being sufficient to effect a further reduction in the amount of polycyclic aromatic compounds in said smoke.

3,893,465
GUIDE DEVICE FOR PLASTIC TUBE EXTRUSION

Lowell K. Cheatwood, Oklahoma City, Okla., assignor to Jess & Lowell Well Casing Co., Oklahoma City, Okla.

Filed Apr. 22, 1974, Ser. No. 462,819
Int. Cl. B05c *3/15*
U.S. Cl. 134—122 8 Claims



1. Apparatus for use in combination with a tubing extrusion device of the type which heat extrudes continuous tubing for axial passage through a coolant filled elongated chamber, comprising:

an elongated guide member formed as a downward opening transversely concave member and having first and second sides, said guide member being secured within said chamber to extend longitudinally axially and above the path of said tubing axial passage;

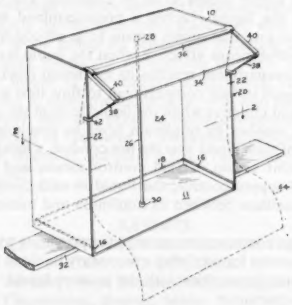
at least one resilient means adjustably secured to opposite ones of said first and second sides, said resilient means being adjusted to form a transverse, upwardly concave and generally parabolic shape wherein the uppermost arcuate portion of said resilient means is disposed in contact with said extruded tubing passing therebeneath; and

means for adjusting the lateral and vertical positioning of said resilient means in relation to the axial passageway of said tubing through said elongated chamber.

3,893,466
PORTABLE COLLAPSIBLE SHELTER

Joseph K. Barker, Rt. 2, Abingdon, Va. 24210

Filed May 7, 1973, Ser. No. 357,833
Int. Cl.[2] E04F *10/10*
U.S. Cl. 135—5 R 4 Claims

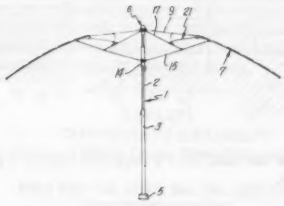


1. A portable temporary shelter comprising top and bottom substantially rigid plates, flexible waterproof end and side walls secured at their upper and lower ends respectively to the end edge portions of said plates and the back portions thereof, movement of said top plate upwardly from said bottom plate stretching said end and rear walls into substantially planiform shape, and a unit structurally separate from said plates and comprising solely a single vertical post extending between said top and bottom plates and having with said plates interengaging portions centrally of said plates, said post being of such a length as to exert an upward force against said upper plate, which force is transmitted by said upper plate radially from said post to maintain said end and side walls in planiform shape, engagement of opposite ends of said post with the respective plates being solely by tight frictional contact therewith, said bottom plate being adapted to support a user of the device on each side of said post.

3,893,467
UMBRELLA

Wilhelm Wingen, Welmlingen, Germany, assignor to Telesco Brophey Limited, Montreal, Canada

Filed Dec. 10, 1973, Ser. No. 423,567
Claims priority, application Germany, Dec. 11, 1972, 7245328[U]
Int. Cl. A45b *19/00*
U.S. Cl. 135—25 R 7 Claims



1. An umbrella frame having a stick; a runner slidable on the stick; a plurality of dome rib assemblies each including a stretcher member pivotably connected at one end to the runner; a dome rib pivotably connected, intermediate its ends, to the other end of each stretcher member; a strut pivotably connected at one end to each stretcher member, intermediate the ends of the stretcher member, and at the other end to the stick; a link connected to the end of each dome rib and to a point on the strut member, the link member, strut member, stretcher member and dome rib member of each assembly forming a quadrilateral structure; at least one member forming said quadrilateral including means for biasing the dome rib away from the stretcher member when the dome rib is moved to a position substantially parallel to, and adjacent, the stretcher member.

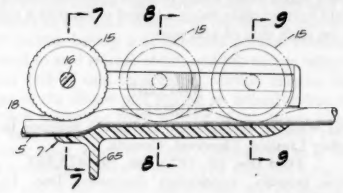
3,893,468
CLAMP FOR FLEXIBLE TUBE AND METHOD OF REGULATING FLOW IN SUCH TUBE

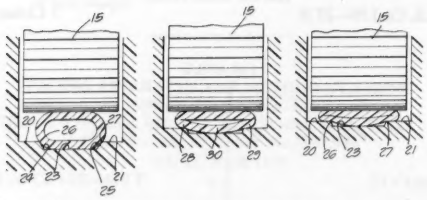
Carles J. McPhee, Sylmar, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed June 22, 1970, Ser. No. 47,958
Int. Cl. F16k *7/06*
U.S. Cl. 137—1 19 Claims

1. For regulating fluid flow rates, the combination of: a resilient tube having a bore therethrough; a clamp body having front and rear ends, a longitudinal channel receiving the tube, and a floor element in the channel fitting against the tube; longitudinal guide means on the body that converges toward the floor element as it proceeds in a forward direction along the clamp body; a pressure element movable along the longitudinal guide means for progressively pinching the tube against the floor element to partially collapse the tube and regulate fluid flow through its bore; the clamp body and pressure element forming about the tube an external clamping structure that includes a pair of ledge surfaces laterally separated by a groove surface defining a longitudinal groove between the ledge surfaces; and which clamping structure pinches opposite side portions of the tube to a greater extent against the ledge surfaces than it pinches a longitudinal central

portion of the tube received within the groove as the pressure element moves along the longitudinal guide means, thereby





reducing flow rate drift over a period of time at a particular clamp setting.

3,893,469

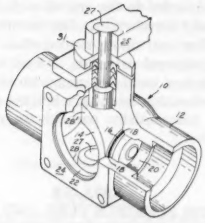
ROTARY PLUG VALVE

Joseph Winston Baker, Plainfield, N.J., assignor to Brunswick Corporation, Skokie, Ill.

Continuation of Ser. No. 278,467, Aug. 7, 1972, abandoned. This application Dec. 16, 1974, Ser. No. 532,873

Int. Cl.[2] F16K *5/06, 27/06*

U.S. Cl. 137—584 **10 Claims**



1. In a rotary plug valve containing a main valve housing with a circular main flow cavity therein and a rotary plug to control fluid flow therethrough journaled on an axis of rotation within the main valve housing, the improvement comprising:

a. a C-shaped rotary plug having two ears and a face, journaled on removable trunnions;

b. circular seal means mounted on the face of the plug for fluid-tight engagement against a sealing surface surrounding the main flow cavity when the valve is in a closed position;

c. a circular access port having a diameter that is smaller than the exterior ear-to-ear distance of the plug but large enough to permit insertion or removal of the plug by manipulation when the plug's trunnions and seal are removed and the plug is rotated from the closed position, having a cross-sectional area of 1.0–1.6 times greater than the cross-sectional area of the main flow cavity, and having a location in a side wall of the housing parallel to the fluid flow, the seal means being completely exposed through the port when the valve is in an open position; whereby the C-shaped rotary plug and its circular seal means may each be inspected, serviced, installed or removed through a single access port only 1.0–1.6 times greater in cross-sectional area than the cross-sectional area of the main flow cavity.

3,893,470

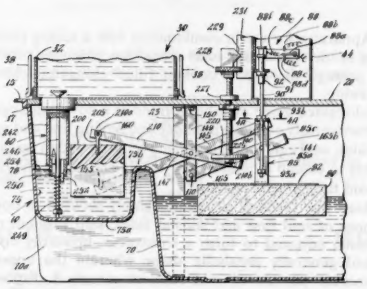
LIQUID MIXING AND DISTRIBUTING APPARATUS

John MacPhee, Rowayton, and Harold W. Gegenheimer, Darien, both of Conn., assignors to Baldwin-Gegenheimer Corporation, Stamford, Conn.

Filed May 20, 1974, Ser. No. 471,208

Int. Cl. G05d *11/13*

U.S. Cl. 137—101.27 **10 Claims**



1. Liquid mixing and distributing apparatus comprising

A. a first compartment for receiving a primary liquid and having a combination therewith

1. first liquid supply means having an on condition in which it can introduce primary liquid into the first compartment and an off condition in which introduction of further primary liquid into the first compartment is precluded;

2. a float in the first compartment which rises and falls with the level of primary liquid in that compartment;

3. a liquid supply control connected with said float and operative when the liquid in the first compartment falls to a predetermined minimum level to turn said first liquid supply means to its on condition and operative when the liquid reaches a predetermined maximum level to turn that supply means to its off condition; and

4. control means effective when the liquid level in the first compartment reaches its maximum level to cause the liquid in that compartment to flow into a use conduit and effective when the liquid level in the compartment reaches its minimum level to preclude further flow of such liquid into the use conduit, whereby under the joint action of said control means and the said liquid supply control, the liquid in said compartment will oscillate between its maximum and minimum levels;

B. A second compartment arranged in proximity to said first compartment for receiving a secondary liquid to be mixed in measured quantities with the primary liquid, said second compartment

1. having a point above which liquid contained in that compartment will overflow into the first compartment; and

2. being provided with secondary liquid supply means effective during use of the apparatus to maintain a constant minimum level of the secondary liquid in the second compartment;

C. a piston extending downwardly into the second compartment, said piston being movable vertically between a relatively elevated position in which it does not displace sufficient secondary liquid to cause such liquid to rise above the overflow point of the second compartment and

a relatively depressed position in which it does displace sufficient secondary liquid to cause such liquid to rise above said overflow point and to flow into intermixing relationship with the liquid contained in the first compartment; and

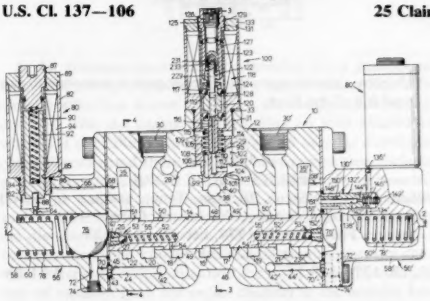
D. means effective to move the piston towards its relatively elevated position as the liquid level in said first compartment falls and effective to move the piston towards its relatively depressed position as the liquid level in the first compartment rises.

3,893,471

PRESSURE COMPENSATING FLUID CONTROL VALVE

James Otto Byers, Jr., Racine, Wis., assignor to Tomco, Inc., Racine, Wis.

Filed Oct. 4, 1973, Ser. No. 403,509
Int. Cl. F16k *11/07*
U.S. Cl. 137—106 **25 Claims**



1. A control valve of the type having a body with a valve spool shiftable from a neutral position at which fluid from a fluid inlet passage network flows through the valve to an operating position at which fluid is directed from the fluid inlet passage network to a pressure passage, said pressure passage in the operative position of said valve spool being connected to one of a pair of cylinder passages, the other of said pair of cylinder passages being connected to a tank passage, the valve being characterized by a flow restricting orifice controlled by said valve spool for restricting fluid flow through the valve, valve means for controlling the flow rate between said inlet passage network and said pressure passage, pressure compensating means operatively associated with each end of said valve spool, means for selectively actuating said pressure compensating means for maintaining the flow rate through said valve means to the pressure passage, said compensating means being in fluid communication with said inlet fluid passage network and said pressure passage whereby said valve spool responds to variations in the pressure differential across said valve means to maintain a fixed flow rate through said valve means.

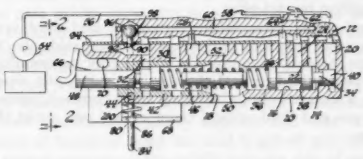
3,893,472

MANUALLY CONTROLLED REGULATOR VALVE WITH EXHAUST CONTROL

David A. Schuster, New Boston, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 12, 1974, Ser. No. 478,597
Int. Cl. B60k *23/00*
U.S. Cl. 137—116.3 **3 Claims**

1. A manually controlled throttle pressure regulator valve comprising; a valve body; fluid passage means in said valve body including an inlet pressure passage, an outlet pressure passage, and an exhaust pressure passage; valve means disposed in said valve body for providing selective fluid communication between said inlet and outlet passages and between said outlet and exhaust passages; manually operated means for imposing a manually controlled bias on said valve means for establishing a variable pressure between maximum and minimum values in said outlet passage proportional to said bias, said valve means establishing communication between said outlet passage and said exhaust passage for reducing the pressure in said outlet passage when the pressure therein is greater than the bias; operator control means mechanically connected



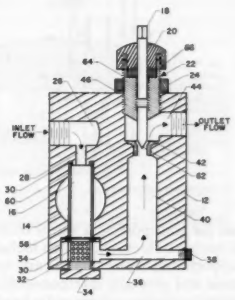
to said manually operated means for transmitting operator motion to said manually operated means; and exhaust control means for preventing exhausting of said outlet passage and maintaining the pressure level in said outlet passage at a predetermined value when said operator control means is disconnected from said manually operated means.

3,893,473

CONDENSATE DRAINER

George E. Breece, 1390 S. Ocean Blvd., Pompano Beach, Fla. 33062

Filed May 14, 1973, Ser. No. 359,908
Int. Cl. F16t *1/34*
U.S. Cl. 137—171 **1 Claim**



1. A condensate drainer in which the internal level of the condensate may be visually determined and is manually maintained comprising:

a housing of unitary construction, said housing having a steam inlet condensate chamber, and a condensate outlet chamber, a vertical passage in communication with said inlet chamber, said vertical passage opening at its upper end into said inlet chamber, a vertically disposed cylindrical chamber coupled at the bottom in communication with said vertical passage having an enlarged radius the inside surface of which is disposed concentrically outside of said vertical passage end, said housing having a lateral passage disposed therethrough, the lower edge of said vertical cylindrical passage opening into said housing lateral passage, a second vertical passage axially in line with said first vertical passage opening into the diametrically opposite side of said housing lateral passage, a strainer chamber in communication with said second vertical passage, a cross-over conduit, a third vertical passage, said cross-over conduit connecting said strainer chamber with said third vertical conduit; and

a tubular glass conduit connected into said housing upper end into the first vertical passage in a fluid-sealed manner having its lower end received into said strainer chamber

with portion of said glass cylinder conduit in contact with said second vertical chamber whereby a portion of said glass conduit disposed within said housing lateral passage is observable from said front face and said rear face of said housing;

a threaded plug coupled into said straining chamber;

a strainer disposed within said strainer chamber, held in position by said plug;

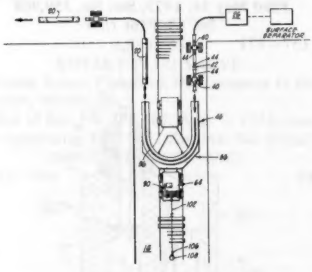
an adjustable valve means separating said third vertical chamber from said outlet flow chamber, said valve movable from an open position allowing for communication between third vertical chamber and said outlet chamber to a closed position stopping fluid communication between said third vertical chamber and said outlet chamber.

3,893,474

CARRIER FOR A BEND-FORMING CONVEYOR

Ronald W. Umphrey, and David L. McCain, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed May 15, 1974, Ser. No. 470,037
Int. Cl. B65g *53/30*
U.S. Cl. 137—344 **11 Claims**



1. In a system for transporting a slurry from a mining machine in a mine having a floor, and which includes at least one flexible hose supported by a plurality of carts spaced along the length of the hose and pivotally interconnected, and wherein the hose is required to be moved around a bend, the improvement comprising:

an elevating conveyor movably supporting the hose and carts off the mine floor in the bend portion of the hose; a vehicle supporting the elevating conveyor;

guide means movably guiding the vehicle; and,

powered means connected to the vehicle and to the mine for moving the elevating conveyor along the guide means.

3,893,475

FLOAT VALVE

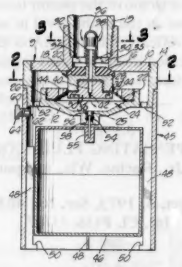
George D. Hudson, 120 Hobbs Cir., Santa Paula, Calif. 93060

Filed Oct. 5, 1973, Ser. No. 403,814
Int. Cl. F16k *31/18*
U.S. Cl. 137—414 **20 Claims**

1. In a float valve for replenishing a body of liquid from a pressurized liquid source in response to drop in the level of the liquid body, wherein a control chamber is in communication with the pressurized source and has a movable wall to exert pressure to close a main valve to cut off the source from the liquid body and a pilot valve operated by a float opens and closes a bleeder port of the control chamber,

the improvement comprising:

said pilot valve including a pilot valve member to open and close the bleeder port, said pilot valve member being fixedly mounted on the float and movable therewith to engage or disengage a seat around said bleeder port to



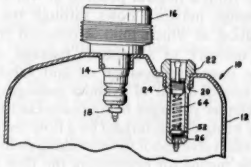
thereby close or open the bleeder port in response to rise and fall of the float.

3,893,476

RELIEF VALVE CORE

William Sylvester Stroh, Dickson, Tenn., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed Mar. 8, 1974, Ser. No. 449,333
Int. Cl. F16k *15/02*
U.S. Cl. 137—543.17 **3 Claims**



1. A pressure vessel having a tubular valve housing mounted in an opening therein, the housing having an interiorly threaded upper portion and an upwardly-facing valve seat therebelow; and a relief valve core in the housing comprising;

a. an exteriorly threaded cylindrical body engaging the interior threads of the housing, the body having an axial recess extending up from the lower end thereof and a bridge extending transversely across the upper end thereof, the bridge having a bore on the axis of the body with a bevelled lead-in from the underside of the bore;

b. a downwardly-facing plunger cup disposed at the lower end of the core and having a radial wall and a connected downward sidewall;

c. a sealing washer disposed in the cup and adapted to seat on the upwardly-facing valve seat to close the valve;

d. a stub shaft having a short section above the cup and extending axially through the center of the radial wall of the cup and being snugly embraced by the sealing washer;

e. pin means extending freely upward through the bore in the bridge and having an outwardly sloping shoulder and an enlarged head below the bridge, the shoulder engaging the bevelled lead-in of the bridge; and

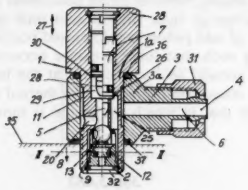
f. a spiral compression spring secured to the head at its upper end and wrapped around the short section of the shaft at its lower end;

whereby when the body is screwed into the housing, the body may be rotated without rotation of the sealing washer.

3,893,477
CONNECTING DEVICES

Kurt Stoll, Lenzhalde, Esslingen, and Gerhard Hihn, Schurwaldstr. 7, Berkheim, both of Germany

Filed July 31, 1973, Ser. No. 384,254
Int. Cl. F16k *15/18*
U.S. Cl. 137—614.2 **9 Claims**

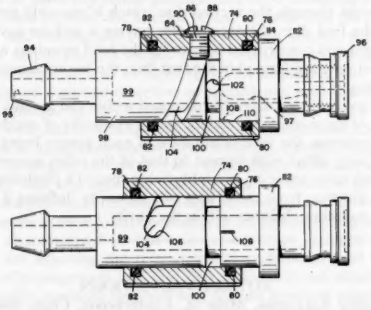


1. An adaptor/connector for a conduit for a gaseous medium comprising a casing having a central bore with a first outlet connection at one end and a connector combined into one unit with the casing and including an inlet connection, which fits over the housing providing an annular distributing channel connected therewith, the inlet connection including a bore therethrough which extends substantially perpendicular to the bore of the housing and communicates with said annular distributing channel, and a radial channel connecting the distributing channel with the central bore, a connection between the outlet connection and the annular bore, a check valve means in such connection for normally preventing the flow of medium from the outlet channel to the annular bore, a connecting channel in the housing parallel to and separate from the annular bore, and extending from a point in the outlet member below the check valve to the end of the annular bore remote from the check valve, and a throttle valve at the end of the annular bore remote from the check valve for controlling the opening between the connecting channel and the end of the central bore remote from the check valve.

3,893,478
SPHYGMOMANOMETER PRESSURE RELIEF VALVE

Rudolph W. Peters, 5786 Balmoral Dr., Oakland, Calif. 94619

Continuation-in-part of Ser. No. 318,575, Dec. 26, 1972, abandoned. This application Feb. 4, 1974, Ser. No. 439,400
Int. Cl.² F16K *11/085*
U.S. Cl. 137—614.2 **8 Claims**

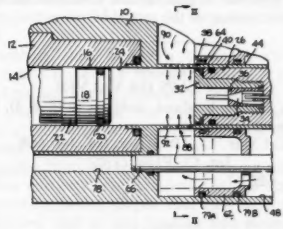


1. A valve for controlling the rate of flow of a fluid from a zero flow through gradual pressure relief to substantially complete and instantaneous full pressure relief, comprising: an axially and rotationally displaceable collar having an axial passage therein and a pin radially extending into said passage; a stationary first member generally disposed within said passage in said collar and having a helical slot wherein is tracked said pin, said pin and said helical slot constituting means for axially moving said collar on said first member when said collar is rotated with respect to said first member, said first member having a through axial passage providing an inlet and an axially opposed outlet, and said first member further having an outwardly opening vent slot having its effective cross sectional area axially increasing in one direction and being in fluid communication with said first member axial passage; sealing means axially displaceable in said one direction and rotationally displaceable in unison with said collar and said pin from a first position on a first axially side of said vent slot and axially spaced therefrom, through a plurality of intermediate positions immediately radially adjacent said vent slot at a plurality of locations along the axial length of said vent slot, to a second position on the axially opposite side of said vent slot and axially spaced therefrom for correspondingly sealing said vent slot with respect to the atmosphere in said first position, providing increasing pressure relief for said first member axial passage through said intermediate positions and completely venting the pressure from said first member axial passage in said second position.

3,893,479
HIGH RATE OF FLOW PORT FOR SPOOL VALVES

Douglas P. Tassie, St. George, Vt., assignor to General Electric Company, Burlington, Vt.

Division of Ser. No. 148,833, June 1, 1971. This application July 11, 1973, Ser. No. 378,146
Int. Cl. F16k *3/24, 3/34*
U.S. Cl. 137—625.3 **4 Claims**



1. A valve for controlling the passage of fluid therethrough, for providing a steep rise to the fluid pulse envelope, comprising:

a valve chamber having a surface which has therein a port means for fluid,

a valve spool having a longitudinal axis and having a ring type seal abuting said surface for closing and for exposing said port means, said valve spool being disposed for rectilinear movement along its longitudinal axis,

said ring type seal having a cross-sectional diameter parallel to said axis,

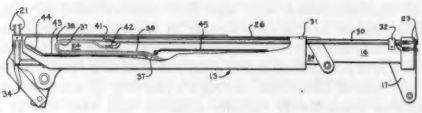
said port means comprising a plurality of bores, each having a respective and identical diameter parallel to said spool longitudinal axis which is smaller than said cross-section diameter of said ring type seal, the total cross-sectional area of said port means being equal to the sum of the cross-sectional areas of said bores,

said plurality of bores being arranged in a pattern of rows transverse to said spool longitudinal axis, the number of said bores in each of said rows being a variable to predetermine the steepness of the rise of the fluid pulse envelope generated by operation of said valve, and arranged in a pattern of acceleration of cross-sectional port area such that as said valve spool moves at a constant velocity to open said port, an increasing cross-sectional port area is exposed per unit time.

3,893,480
HYDRAULIC LINE ASSEMBLY

Glenn G. Dunbar, 2608 Overbrook Dr., Toledo, Ohio 43614

Filed Dec. 26, 1973, Ser. No. 427,986
Int. Cl. B65h 75/36
U.S. Cl. 137—615 6 Claims



1. A hydraulic line assembly for use on an extensible boom having a fluid supply source, a non-extending base section and a movable arm section extending outwardly from said base section, said assembly comprising,

a rigid conduit assembly having at least two independent fluid transfer conduits, said rigid conduit assembly having its forward end attached adjacent the forward end of such movable arm and its rearward end slidably mounted on such base section,

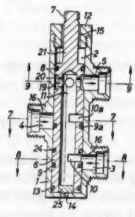
a plurality of flexible conduits positioned adjacent such base section, said flexible conduits having forward ends attached to and in fluid communication with said independent fluid transfer conduits, their other ends being in communication with the fluid supply source, and

a housing positioned on the exterior of the non-extending base section, said housing defining a chamber for receiving said flexible conduits and stationary divider means mounted within said housing for maintaining separation between portions of said flexible conduits during extension and retraction of the movable arm.

3,893,481
MIXER TAPS OR VALVES

Horace Watts, Pinner, England, assignor to H. & D. E. Watts Limited, Pinner, England

Filed Mar. 13, 1973, Ser. No. 340,688
Int. Cl. F16k 11/02
U.S. Cl. 137—625.17 3 Claims

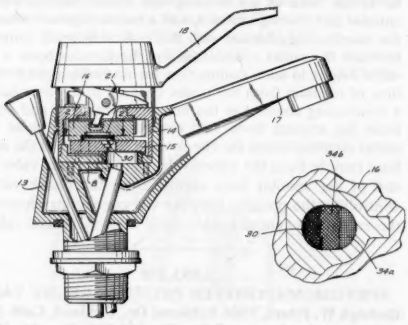


1. A mixer tap or valve for hot and cold water supplies comprising a housing having an inner surface defining a cylindrical chamber; laterally disposed inlet ports for the respective supplies, said inlet ports being spaced apart in the longitudinal direction of said chamber and communicating therewith; at least one outlet port for said supplies or a mixture thereof communicating with said chamber; a cylindrical piston arranged for rotation and reciprocation in said chamber and movable axially between an open and a closed position; passage means in said piston for providing communication between said inlet ports and said at least one outlet port and adapted to cooperate with said inlet ports so as to select or mix the supplies and to control the volume thereof; and sealing means between said piston and said surface and comprising a plurality of axially spaced coaxially disposed annular sealing members located respectively in annular grooves in said piston and bearing with sliding and sealing engagement against said surface, one of said sealing members being arranged in such a manner as to be located always between the two inlet ports without overlapping either of the same in open as well as in closed position of the valve and at least one other of said sealing members being located with a slight stretch fit in its groove to prevent said at least one other sealing member to bulge locally unduly into the associated inlet port, said at least one other sealing member being positioned to move at least partially across at least one of said inlet ports upon axial movement of said piston to said closed position, the arrangement being such that surge pressure occurring upstream of said other annular sealing member at the instant of closure acts on the transverse projected area thereof in the same axial direction as that in which the piston is moved to close the valve.

3,893,482
LOW NOISE FAUCET

Bernd Loose, Krov, Mosel, Germany, assignor to American Standard Inc., New York, N.Y.

Filed Nov. 5, 1974, Ser. No. 521,129
Claims priority, application Germany, Nov. 10, 1973, 2356326
Int. Cl.[2] F16K 11/00
U.S. Cl. 137—625.17 10 Claims



1. In a water faucet having a valve body with control elements formed by two discs, the first disc being stationary and having water inlet openings and water outlet opening connected on one side to a valve manifold and on the other side directed towards the second disc which is movably arranged on the first disc, the second disc having a surface cavity arranged and constructed to overlap the inlet openings and the outlet opening formed in the first disc, the improvement comprising:

noise reducing assembly disposed within the surface cavity of the second disc and including a plurality of overlapping screens, the wire orientation of each screen being angularly offset with respect to that of the other screens;

said noise reducing assembly being spaced a predetermined distance from the ceiling of said cavity defining a noise-isolating chamber within the cavity.

3,893,483
ROTARY VALVE TRAIN

Timothy Ackerman, Main St., Centerbrook, Conn. 06409

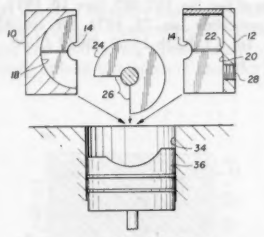
Filed Jan. 4, 1974, Ser. No. 430,904
Int. Cl. F01l 7/00
U.S. Cl. 137—625.21 4 Claims

1. A rotary valve train comprising:

an elongated block having an axial bore and a plurality of longitudinally spaced recesses centered on the bore and extending outward at right angles, each recess being

ported and having first and second halves, the first half being semi-circular, the second half being rectangular;

an elongated shaft rotatable about its axis disposed in the bore; and



a like plurality of circular discs, each centered on and secured to the shaft and rotated therewith, the discs being longitudinally spaced, each disc being disposed in a corresponding recess and rotatable therein, each disc having a cut out portion defining a circular sector.

3,893,484

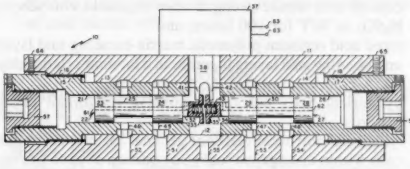
CYLINDER AND PISTON VALVE

James Thomas Greene, Salem, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed July 27, 1973, Ser. No. 383,367

Int. Cl. F15b *13/02, 5/00;* **F16k** *11/07, 11/10*

U.S. Cl. 137—625.65 **5 Claims**



1. A valve system including a housing formed to define a hollow cylinder, first and second separate pistons, each including a plurality of lands, disposed in opposite ends of said cylinder, said housing being formed to define first and second groups of generally radial passageways each providing communication between the interior of said cylinder and the exterior of said housing and cooperating with said first and second pistons respectively, a torque motor including an actuating arm and responsive to an input signal for displacing said arm in a first or a second direction in accordance with the sense and magnitude of said signal, said torque motor being disposed with said actuating arm extending within said hollow cylinder at approximately the axial midpoint thereof, resilient means for urging said pistons into engagement with said arm, whereby said arm and said resilient means cooperate to displace said pistons in response to said input signal and to return said pistons to their former positions in the absence of an input signal, characterized in that said valve system includes first means for adjusting the relative positions between said first group of passageways and said first piston without adjusting the relative positions between said second group of passageways and said second piston and second means for adjusting the relative positions between said second group of passageways and said second piston without adjusting the relative positions between said first group of passageways and said first piston in order to establish a reference position at which the lands of each piston are located symmetrically with respect to said passageways in the absence of an input signal.

3,893,485

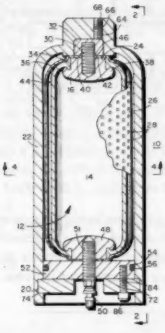
PULSATION DAMPENER

Ernest W. Loukonen, 615 W. Civic Center Dr., Long Beach, Calif. 92701

Continuation of Ser. No. 178,307, Sept. 7, 1971, abandoned. This application June 25, 1973, Ser. No. 373,110

Int. Cl. F16l *55/04*

U.S. Cl. 138—30 **7 Claims**



1. A bladder assembly for a pulsation dampener comprising:

a flexible cylindrical bladder with generally dome shaped end walls each having an opening on the axis of the bladder and a thickened annular rim portion surrounding said opening and forming about the opening an inner axially projecting sealing lip at the inner side of the respective end wall and an outer axially projecting sealing lip at the outer side of the respective end wall,

two anchors each having a central portion extending through a respective bladder opening and an enlarged head portion seating against the inner side of the respective bladder end wall and containing an annular sealing groove receiving the respective inner sealing lip of the bladder,

two anchor bolts each coaxially secured to a respective anchor and extending externally of said bladder,

two generally dome shaped end caps each fitting over a respective end of said bladder and having an annular sealing shoulder surrounding and engaging the respective outer sealing lip of said bladder and a central opening through which the corresponding anchor bolt extends,

a generally cylindrical screen extending between the two end caps in surrounding relation to said bladder and joined to said end caps, and

one anchor bolt containing an axial passage through which the interior of said bladder may be pressurized.

3,893,486

ACCUMULATOR WITH TEMPERATURE COMPENSATION

Robert E. Meyers, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed May 16, 1973, Ser. No. 360,705

Int. Cl. F16l *55/04*

U.S. Cl. 138—31 **10 Claims**

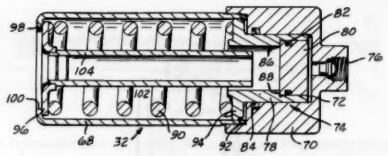
1. A vessel for storing fluid under pressure comprising:

a hollow housing having a closed end connectible to a fluid pressure source;

composite piston means including first and second relatively movable portions, said composite piston means being slidably disposed in the housing and forming a variable volume chamber with the closed end;

resilient means engaging the first portion of the composite piston means and urging the composite piston means toward the closed end; and

stop means against which the second portion of the composite piston means is urged when the pressure and volume of fluid in the chamber have attained predetermined values respectively;



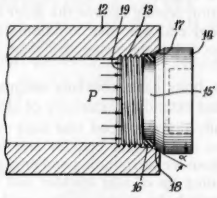
said composite piston means being responsive to an increase in volume of fluid above said predetermined volume to increase the volume of said chamber to compensate for fluid expansion due to temperature rise.

3,893,487

HIGH PRESSURE HYDRAULIC FITTING

Frederick S. Engelking, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 26, 1973, Ser. No. 428,614
Int. Cl. B65d *51/00*
U.S. Cl. 138—89 **6 Claims**



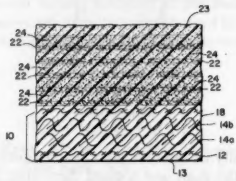
1. A fitting assembly for a high pressure fluid system including; housing means for containing said high pressure fluid, said housing means including an axially extending bore, plug means for being received within said bore for selective closure thereof, seal means disposed between said plug means and said housing means for preventing egress of fluid from said bore when said plug means is positioned for closure thereof, said housing means including a first bevelled surface proximate said seal means and disposed at a first predetermined angle with respect to the axis of said bore, said plug means including a second bevelled surface proximate said seal means and disposed at said first predetermined angle with respect to said axis for abutting engagement with said first bevelled surface when said plug means is positioned for closure of said bore, said first predetermined angle being acute, said plug means including a plug member having an enlarged head portion and having a reduced section shank portion, said plug member further having a further reduced section annular groove thereon axially between said head portion and said shank portion, said seal means being disposed in said annular groove and not between said first and second bevelled surfaces.

3,893,488

CORROSION RESISTANT GEL COATING LINING FOR COMPOSITE PLASTIC PIPE

Philip A. Rogers, Neshanic Station; Jack E. Hesse, Somerville, and Joseph P. Ferraro, Scotch Plains, all of N.J., assignors to Johns-Manville Corporation, Denver, Colo.

Continuation of Ser. No. 197,397, Nov. 10, 1971, abandoned. This application Jan. 25, 1974, Ser. No. 436,572
Int. Cl. B32b *15/02*; **D03d** *13/00*
U.S. Cl. 138—141 **14 Claims**



1. An improved corrosion resistant gel coat for use as an exposed inner lining in reinforced plastic sewer pipe, comprising:

a cylindrical inner layer formed by a spunbonded polyester fibrous sheet, said sheet having a break elongation of at least 40 percent and formed of fibers that retain at least 50 percent of their tensile strength when exposed to 60 percent H_2SO_4 at 70°F for 100 hours;

an adjacent cylindrical layer of woven polyester fabric, said adjacent layer having a break elongation of at least 20 percent and formed of fibers that retain at least 50 percent of their tensile strength when exposed to 60 percent H_2SO_4 at 70°F for 100 hours; and

a cured acid resistant polymeric matrix encasing said layers and bonding said layers together in a laminar relationship.

14. A composite plastic pipe, comprising:

a cylindrical body portion comprising reinforced plastic material; and

a cylindrical corrosion resistant gel coat located concentrically within and against said body portion so as to provide an inner liner for said body portion, said gel coat including

a cylindrical inner layer comprising a sheet of spunbonded polyester fibers,

a cylindrical layer of woven polyester fabric located radially outwardly from said inner layer, and a cured polyester matrix bonding said layers together in a laminar relationship and bonding the gel coat to said body portion.

3,893,489

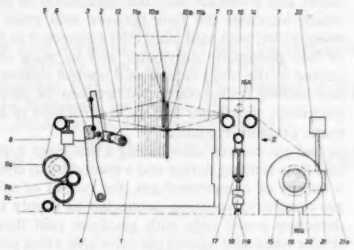
APPARATUS FOR REGULATING THE TENSION OF WARP THREADS IN POWER LOOMS

Friedrich Wilhelm Bassing, and Gottfried Gerhard Wilhelm Hoffmann, both of Hamburg, Germany, assignors to ALFA-LAVAL Bergedorfer Eisenwerke GmbH, Hamburg, Germany

Filed Dec. 11, 1973, Ser. No. 422,937
Claims priority, application Germany, Dec. 12, 1972, 2260607
Int. Cl.²D03D *49/06*, *49/10*
U.S. Cl. 139—110 **10 Claims**

1. In a power loom, a combination comprising a frame; at least one rotary warp beam; a variable-speed hydraulic motor for rotating said warp beam in a direction to pay out warp threads; means for collecting the fabric obtained by interweaving said warp threads with filling threads at a weaving station; and an arrangement for regulating the let-off of the warp threads with constant warp thread tension, said arrangement comprising:

a. a pair of spaced-apart guides located between said warp beam and said weaving station and arranged to engate one side of each warp thread,
b. a displaceable dancer roll resting in a bight of the warp threads between said guides and engaging the other side of each warp thread,
c. a support member rotatably supporting said dancer roll,
d. hydraulic cylinders connecting said support member to said frame and each having a piston reciprocably therein and defining at least one pressure chamber,



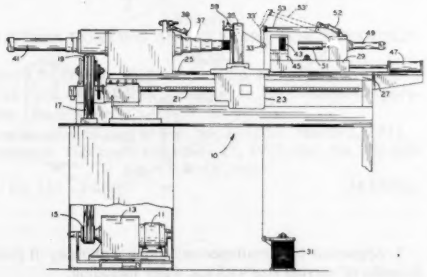
e. conduit means connecting each pressure chamber to a source of pressurized hydraulic fluid for urging said dancer roll against the warp threads,
f. an adjustable constant pressure regulating valve connected to said conduit means for maintaining a constant pressure in said pressure chambers irrespective of the position of said dancer roll, and
g. regulating means continuously actuated by said support member for adjusting the flow of pressurized hydraulic fluid to said hydraulic motor in response to displacement of said dancer roll.

3,893,490

WINDING AND INSERTING APPARATUS AND METHOD

Hollace R. McKinley, and Leo M. Schlaudroff, both of Fort Wayne, Ind., assignors to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 306,527, Nov. 15, 1972, abandoned. This application Apr. 8, 1974, Ser. No. 458,460
Int. Cl. B21f *3/04*
U.S. Cl. 140—92.1 **8 Claims**



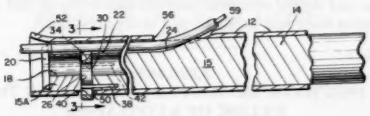
1. A method of winding and inserting at least one coil group into a stator core, comprising:
winding electrically conductive wire about a coil form to thereby create a coil group;
collapsing the coil form to relieve the tension on individual turns and thereby allow movement of the coil group;
passing a guide member through the stator core so as to align the core and guide member;
moving a portion of the coil form with the coil group suspended therefrom toward the guide member until the portion of the coil form and guide member mesh to thereby properly align the portion with the guide member;
continuing to move the portion of the coil form so as to force the guide member back through the stator bore, with the guide member maintaining porper alignment of the portion of the coil form and the stator core until the portion of the coil form enters the bore of the stator and at least until means associated with the portion of the coil form engage the stator core so as to maintain proper alignment of the portion of the coil form and the stator core.

3,893,491

COMBINATION INSULATED CONDUCTOR WIRE STRIPPING CUTTING AND WRAPPING TOOL

Edmond F. Jackson, Jr., West Warwick, and Daniel T. Hannify, Warren, both of R.I., assignors to Ostby & Barton Co., Providence, R.I.

Filed Sept. 6, 1974, Ser. No. 503,592
Int. Cl.[2] B21F *15/00*
U.S. Cl. 140—122 **4 Claims**



1. A device for stripping and wrapping wire about a terminal in a series of successive convolutions comprising
a rotatable wrapping bit having an end face,
said bit having a terminal receiving means and insulated conductor receiving means with both means opening to said end face,
a transverse slot extending diametrically across said bit inwardly of said end face,
a knife means received in said slot for sliding movement therein,
said knife means having a central aperture and a cutting edge at one end thereof disposed normally out of said conductor receiving means,
the other end of said knife means having an arcuate edge,
a sleeve disposed about said bit and including a partial circumferential slit forming an opening to receive the other end of the knife,
and means to reciprocate said knife in said slot.

3,893,492

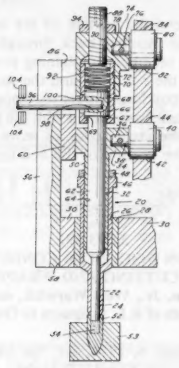
APPARATUS AND METHOD FOR ACCURATELY DISPENSING AND CONSOLIDATING POWDERED MATERIAL INTO RECEPTACLES

John E. Nohren, 1760 Long Bow Ln., Clearwater, Fla. 33516

Filed Aug. 6, 1973, Ser. No. 385,890
Int. Cl. B65b *1/16*
U.S. Cl. 141—1 **21 Claims**

1. A method for repetitively dispensing an accurate charge of particulate material from a supply container to a charge container comprising the steps of creating a predetermined volume open ended charge cavity after and while the open end of said charge cavityis submerged within said particulate material in said supply container in a manner adapted through the creation of said cavity per se to cause the filling of said cavity with said material, creating a predetermined volume reduction of said cavity while the open end of said charge cavity remains submerged within said particulate material in said supply container in a manner adapted to cause deaeration

and precompaction of the charge material within said cavity, the removal of said reduced cavity with said charge material



from said supply container, and the dispensing of said charge material from said charge container.

3,893,493

PNEUMATIC DEVICE FOR CONTROLLING THE FILLING OF A CONTAINER

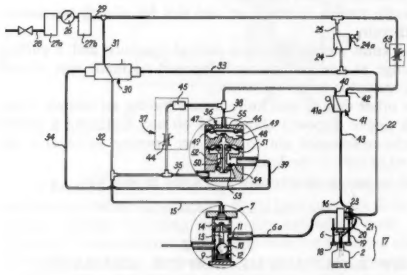
Jacques Foirest, Montfermeil; Emile Ballin, Aulnay-sous-Bois, and Guy Favero, Tremblay-les-Gonesse, all of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Filed Dec. 20, 1973, Ser. No. 426,688

Claims priority, application France, Dec. 21, 1972, 72.45571

Int. Cl. B65b *31/00*

U.S. Cl. 141—47 **10 Claims**



1. In a pneumatic device for controlling the filling of containers, said device comprising at least one filling head including a liquid supply tube for introducing liquid into a container and a level detecting probe through which a flow of air is simultaneously introduced into said container, said probe having an opening positioned near a predetermined level to which a container in filling position relative to said head is to be filled, said liquid supply tube being provided with a liquid control valve controlling the flow of liquid therethrough, and control means connected between said liquid control valve and said level detecting probe, the improvement according to which said control means comprises:

a detector valve responsive to the presence of a container in said filling position and a first gas control valve connected to supply gas to said detector valve,

a pneumatic distributor having a control member therein which controls the flow of gas through said distributor, the output of said distributor being connected to actuate said liquid control valve and the output of said first gas valve being connected to said distributor at one side of said control member, the pressure supplied to said distributor from said first gas valve being insufficient to operate said control member to open said liquid control valve when said detector valve is open, but sufficient to do so when said detector valve is closed,

a pneumatic pressure regulator having a main inlet, a main outlet and a control inlet the application of pressure to which increases the flow between said main inlet and main outlet, with said main inlet connected to the output of said pneumatic distributor and its main outlet connected to the other side of said control member,

a flow-limiting device connected between the output of said pneumatic distributor and the control inlet of said pneumatic pressure regulator,

a second gas control valve having a first input connected to said flow-limiting device and a second input connected to a source of compressed gas, the output of said second gas-control valve being connected to supply said level-detecting probe only with gas from said flow limiting device when said second gas valve is in a first position and only with gas from the second input of said second gas control valve when said second gas control valve is in a second position,

whereby whenever flow from said second gas control valve input through said second gas valve is blocked by closure of the opening in said probe or by location of said second gas valve in its second position, the resulting pressure in the second input of said second gas control valve is applied to the control inlet of said pneumatic pressure regulator to increase the output pressure applied through said regulator to said other side of said control member, thereby reversing the position of said distributor to close said liquid supply valve.

3,893,494

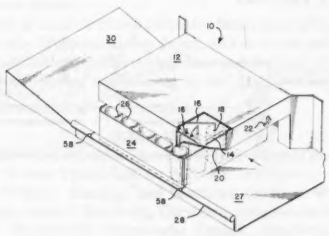
MULTIPLE GLASS FILLER APPARATUS

Robert W. Whitney, 1235 Second Ave., Seattle, Wash. 98109

Filed June 22, 1973, Ser. No. 372,661

Int. Cl. B65b *3/36*

U.S. Cl. 141—244 **7 Claims**



1. Apparatus for simultaneously filling a plurality of glasses in racks of varying size with ice water including:

a rack supporting counter having glass icing, filling, leveling and draining stations;

said glass filling station including a water supply pipe, three-way valve means regulating the flow of water from said supply pipe, first and second sets of branch pipe means separately selectively interconnectable with said water supply pipe by said three-way valve means, a plurality of distribution tubes mounted on the top surface of said branch pipes and extending outwardly to points above each glass in a rack positioned therebeneath;

said glass filling station further including a cabinet enclosing said sets of branch pipes and said distribution tubes and including a bottom plate having a plurality of holes therein, each hole being associated with the outlet end of one of said distribution tubes;

said rack supporting counter including an inclined portion over which a rack of filled glasses is moved to cause a portion of the water therein to spill to equalize the level of water in all glasses in said rack; and,

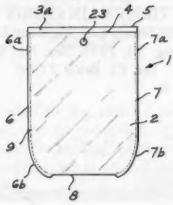
drain means on said counter associated with said filled glass draining station to collect water spilled from said glass.

3,893,495

HOLDER FOR A TRANSLUSCENT OR TRANSPARENT BOTTLE CONTAINING A LIQUID

Robert Standifer, Fort Lauderdale, Fla., assignor to North American Biologicals, Inc., Miami, Fla.

Filed May 16, 1974, Ser. No. 470,531
Int. Cl. A61j *12/00*
U.S. Cl. 150—52 R **4 Claims**



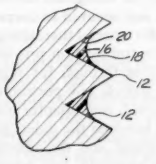
1. A holder for a bottle having a neck portion and containing a therapeutic liquid, said holder comprising bag made of a pliable transluscent synthetic plastics material, said bag having two sides biased to assume a flat and engaging relationship when the bag is empty, one end edge of the bag being open, said edge constituting the entry end of the bag for inserting a bottle thereinto, the width of the bag being reduced toward the end edge thereof opposite to the open edge of the bag, said opposite end being open for a length shorter than said one edge to constitute a slot for passage of the neck portion of the bottle, the two sides of the bag being spreadable relative to each other for accommodating the body of the bottle therebetween, said slot retaining the bottle within the bag except for the neck portion thereof.

3,893,496

FRICTION COATING AND SEALANT FOR THREADED PARTS

Richard B. Wallace, Bloomfield Hills, and Sidney L. Reegen, Oak Park, both of Mich., assignors to The Oakland Corporation, Troy, Mich.

Continuation-in-part of Ser. No. 231,420, March 2, 1972, abandoned. This application July 27, 1973, Ser. No. 383,059
Int. Cl. F16b *39/00*
U.S. Cl. 151—14.5 **34 Claims**



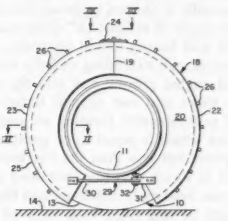
1. A friction construction comprising a first member having a smooth surface normally movable in sliding relation under pressure against a similarly shaped smooth surface of a companion member, said first member having a dry deposit of a solid friction producing material permanently bonded to the smooth surface of said first member prior to bringing said first member into juxtaposition to said companion member, said deposit having a non-tacky outer surface to prevent treated members from sticking together, having a high viscosity such that viscous flow takes place under continuous applied force, and characterized in that the resistance to separation of the bond to the smooth surface of said one member exceeds the resistance to viscous flow under continuous applied force, and in that the outer surface of said deposit has a high friction value opposing relative movement between said one member and a companion member, said material being essentially a resinous mixture comprising a major proportion of an acrylic polymeric material, and a minor proportion of an adhesion promoting polymer in an amount effective to increase the strength of the bond of the resinous mixture to the smooth surface of said first member compared to the strength of the characteristic bond between the acrylic polymeric material and the smooth surface.

3,893,497

ANTI-SKID DEVICE FOR AUTOMOBILE TIRES AND THE LIKE

Ernest Vagias, 265 Prospect St., Baden, Pa. 15005

Filed Nov. 20, 1973, Ser. No. 417,502
Int. Cl. B60c *11/00*
U.S. Cl. 152—179 **7 Claims**



1. An anti-skid apparatus to envelop all but a circular segment just sufficient to permit independent support of a vehicle by the exposed tread of a pneumatic tire thereof upon the ground, said apparatus comprising:

an anti-skid casing including a tread wall and two spaced-apart side walls extending from the edges of said tread wall; said casing excluding a circular segment just sufficient to insure the establishment of an enveloping relation with said pneumatic tire while the tire independently supports the vehicle upon the ground; said casing defining the remaining portion of the circular segment and being divided at its two side walls to form two casing parts and that are hinged together only at the tread wall, at least said tread wall and one of said side walls being discontinuous to define an arcuate gap between terminal ends of the two casing parts just sufficient to independently support said vehicle by the pneumatic tire thereof,

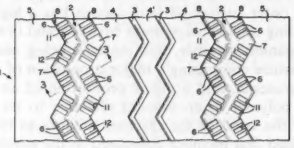
the hinged connection at the tread wall joining said casing parts together for pivotal movement only at the tread wall by displacing the terminal ends of the casing parts so as to pass said anti-skid casing into a partially surrounding relation with the tread portion of said pneumatic tire while supporting said vehicle upon the ground, and

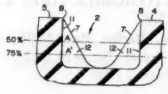
interconnecting fastening means carried by at least one of the side walls of said casing parts at the free ends thereof to span the distance between the terminal ends thereof for holding said anti-skid casing onto said pneumatic tire.

3,893,498
PNEUMATIC TIRE

Lee Wayne, Barberton, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed June 13, 1974, Ser. No. 478,992
Int. Cl.² B60C 11/06, 11/12
U.S. Cl. 152—209 R 12 Claims



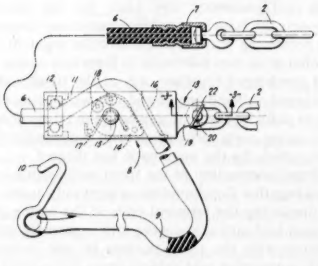


1. A pneumatic tire having a tread with a tread design therein, said design having at least one groove, said groove having a substantially V-shaped cross-section with at least one of its walls at an angle of at least 18° to the radial plane of the tire, said angled wall having lateral channels, each said channel having a lateral wall extending radially inwardly from the junction of said angled groove wall and the road-contacting surface of the tread and two spaced transverse walls, said lateral walls of said channels forming an angle to said radial plane of said tire which is equal to or greater than the angle of said radial plane but less than the corresponding angle of said angled wall in which they are contained so that the tire's resistance to stone holding is improved and the effective road-contacting length of said transverse walls of said channel is increased as the tire tread is progressively worn.

3,893,499
INSIDE LATCH UNIT FOR TIRE CHAINS

Robert L. Von Der Hellen, Riley Rd., Eagle Point, Oreg. 97524

Filed Mar. 8, 1974, Ser. No. 449,346
Int. Cl. B60c 27/06
U.S. Cl. 152—213 A 3 Claims

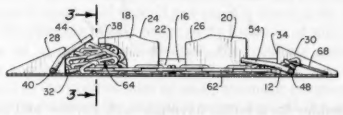


1. In tire chains which include an outer circumferential tire chain, an inner circumferential tire chain, spaced cross chains connected between the side chains at intervals, an outside latch unit adapted to end-connect the outer side chain, and a flexible pull-cord actuated inside latch unit adapted to end-connect the inner side chain; the improvement characterized by the inside latch unit comprising a self-acting, eccentric-cam, cord-locking device through which the pull-cord extends intermediate its ends, the pull-cord being connected to one end of the inner side chain, and means connecting the cord-locking device to the other end of the inner side chain, the pull-cord extending in initially slidable relation through the cord-locking device, and the latter being arranged to lock the cord against retraction when said cord is manually pulled through the device until tensioned between the ends of the inner side chain and the latter is drawn taut; said connecting means for the cord-locking device including initially engaged but manually disengageable parts whereby to disconnect the cord-locking device from the inner side chain, and a case in which the eccentric-cam is pivoted, the cam having a peripheral edge leading to a cord-locking point, said case including an annular bearing ahead of the eccentric-cam; the cord entering the case in free-sliding relationship through said annular bearing and then extending about said peripheral edge.

3,893,500
TIRE CHAIN CADDY

Vernon L. Planz, 469 Shady Ln., Big Bear Lake, Calif. 92315

Filed Aug. 30, 1974, Ser. No. 502,051
Int. Cl. B60c 27/00
U.S. Cl. 152—213 R 9 Claims



1. A tire chain caddy comprising:
a base;
a pair of spaced apart main members attached to said base;
a pair of inclined members attached to said base with a said inclined member located adjacent each longitudinal end of said base, a pocket located between each said inclined member and its adjacent main member, side passageways formed upon said base on either side of said main members; and
locking means for closing each of said pockets thereby preventing removal of links of chain contained within said pockets.

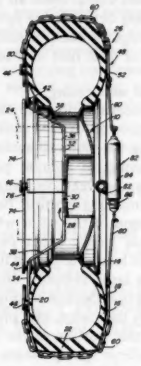
3,893,501
VEHICLE WHEEL SKID CHAINS

William J. Brummer, 6930 S. 123rd St., No. 186, Seattle, Wash. 98178, and Richard F. Brummer, 31055 168th Way S.E., Auburn, Wash. 98002

Filed Sept. 24, 1974, Ser. No. 508,764
Int. Cl.² B60C 27/10
U.S. Cl. 152—213 R 9 Claims

1. A skid chain construction including at least one pair of skid chain assemblies, each of said skid chain assemblies including a pair of generally arcuate and parallel anchor assemblies, a plurality of elongated flexible traction members extending between and secured to corresponding portions of said anchor assemblies spaced therealong, a mounting adapter plate including a central portion provided with a pattern of apertures formed therethrough for registry with the wheel mounting lugs of a vehicle hub portion upon which a vehicle wheel may be mounted, said adapter plate being adapted for clamped mounting between the inner side of the central portion of a vehicle wheel and the vehicle hub portion upon which the wheel is mounted, said adapter plate including a pair of generally radially outwardly projecting diametrically opposite mounting arms including outer end portions deflected outwardly to the same side of said plate, mounting

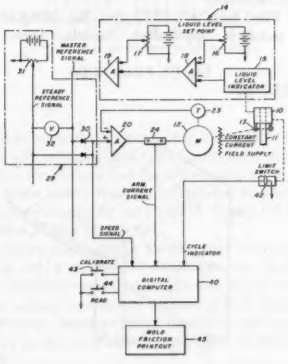
means carried by the outer end portions of said arms to which the mid-portions of one pair of corresponding anchor assemblies are releasably anchored for oscillation about axes disposed generally normal to the plane containing the central portion of said plate, and an elongated adjustable length tension member assembly extending between and anchored to the other pair of corresponding anchor assemblies.



3,893,502
METHOD AND MECHANISM FOR INDICATING MOLD FRICTION IN A CONTINUOUS-CASTING MACHINE

Frank Slamar, Pittsburgh, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed May 31, 1974, Ser. No. 475,082
Int. Cl. G01l 5/00
U.S. Cl. 164—4 **20 Claims**

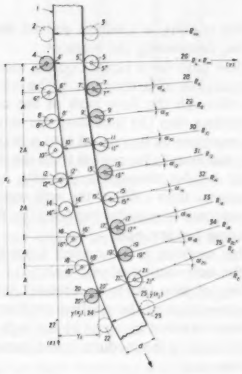


1. In a continuous-casting operation in which liquid metal is introduced continuously to the top of an open-ended mold, a partially solidified casting of indefinite length emerges from the bottom of the mold, and the mold is oscillated vertically, the movement of said casting through said mold being opposed by friction, and in which the drive means for oscillating the mold includes a motor operatively connected therewith, the magnitude of the armature current to said motor being proportional to the load on the motor, an improved method of determining the magnitude of the mold friction, said method comprising measuring the magnitude of the armature current to said motor with the motor oscillating the mold through a representative number of cycles during a casting operation, and compensating for factors which contribute to the load on the motor other than mold friction.

3,893,503
CONTINUOUS CASTING PLANT

Erich Eibl, Linz, Austria, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Oct. 18, 1973, Ser. No. 407,473
Claims priority, application Austria, July 24, 1973, 6511/73
Int. Cl. B22d 11/12
U.S. Cl. 164—282 **21 Claims**



1. In a continuous casting plant for strands comprising a mold and means defining a secondary cooling zone following the mold, the secondary cooling zone including guiding rollers and bending rollers arranged to define a bending zone of a certain extent, the bending rollers being arranged along a transition curve from the vertical direction into a circular arc, the improvement comprising that the bending rollers are arranged along a curve corresponding to the differential equation

$$Y''' = \phi'(x_1) \cdot \frac{1}{\int_0^{X_E} \phi'(x_1)\,dx}$$

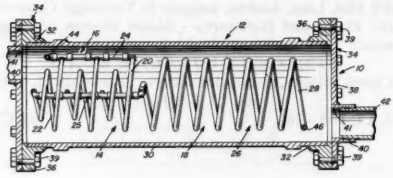
R_E

$\phi'(x_1)$ being a function of the change in elongation of a radially outer side of a cast strand, which function, over the extent of the bending zone, is graphically represented, in a Cartesian coordinate system in which change in elongation in 10^{-2}%/mm is plotted as the y-coordinate and relative position along the transition curve in mm is plotted as the x-coordinate, by a curve that at first takes an ascending course, reaches a maximum permissible change in elongation and then takes a descending course, R_E standing for the radius in mm of the circular arc at the end of the bending zone measured to the outer side of the strand, X_E for the vertical component of the length of the bending zone, and x_1 being a position coordinate in a Cartesian coordinate system whose origin lies at the beginning of the transition curve and whose x-axis is a tangent to the transition curve on the outer side of the strand.

3,893,504
METHOD FOR TRANSFERRING HEAT

Paul C, Gaines, Jr., 1043 Algonquin Trl., Frankfort, Ky. 40601

Division of Ser. No. 199.989, Nov. 18, 1971. This application Dec. 7, 1973, Ser. No. 422,780
Int. Cl.[2] F28F 9/22; G05D 15/00
U.S. Cl. 165—1 1 Claim

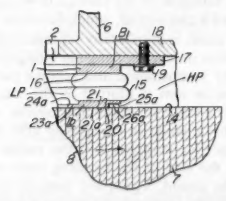


1. A method for cooling a medium passed from a high temperature system, comprising the steps of:
a. providing a flow path for a liquid cooling medium;
b. retarding expansion of a medium to be cooled while passing same through the flow path of the cooling medium, the retarding step (b) including the steps of:
i. passing the medium to be cooled into a first header;
ii. passing the medium to be cooled from the first header to a second header through a plurality of loops of smaller diameter than coils of the coil section of step (b) and connected in parallel between the first header and the second header; and
iii. passing the medium to be cooled from the second header to the coil section of step (b);
c. limiting cooling of step (b) to an amount sufficient for preventing evaporation of the cooling medium;
d. passing medium retarded by step (b) through a coil section for further cooling the medium in the presence of the cooling medium; and
e. providing the coil section of step (d) with size sufficient to completely reduce the temperature of the medium being cooled to that of the cooling medium.

3,893,505
ROTARY REGENERATIVE HEAT EXCHANGERS COMPRISING SEALING DEVICES HAVING ANNULAR SEALING PLATES

Kenji Fujikake; Masao Kitano; Tsubura Nishiyama, all of Nagoya, and Hisashi Sugimoto, Aichi, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoyo, Japan

Filed Dec. 28, 1971, Ser. No. 213,007
Claims priority, application Japan, Dec. 29, 1970, 45-129803
Int. Cl. F28d 19/00
U.S. Cl. 165—9 9 Claims

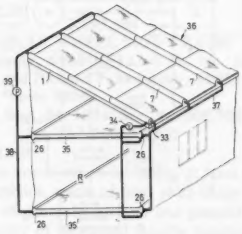


1. A rotary regenerative heat exchanger comprising:
a casing having exhaust gas passage openings and compressed air passage openings,
a regenerative matrix rotor rotatably mounted in said casing,
a first and second sealing devices disposed between said casing and said regenerative matrix rotor, said first sealing device being provided annularly along the peripheral edge of one of said compressed air passage openings, and said second sealing device being provided annularly along the peripheral edge of each of said exhaust gas passage openings, each of said first and second sealing devices comprising:
a flange secured to said casing,
a resilient spring means secured to said flange,
a sealing plate supported by said resilient spring means for slidably engaging the sidewall surface of said rotor, said sealing plate having an arcuate portion and remaining portion extending between opposite ends of said arcuate portion, said remaining portion being traversed by the rotational direction of the rotor when it is rotated from one pressure side to the other pressure side, and said sealing plate of at least one of said first and second sealing devices that has large pressure differential between the interior and exterior thereof having a projecting portion formed integrally therewith, said projecting portion being projected from that portion of the sealing plate which is fixed to the resilient spring means toward the counter-direction of the rotation of the rotor, and said projecting portion being in direct contact with said one face of the rotor and being elongated continuously over a predetermined length from one end part of said arcuate portion to the middle portion of the length of said remaining portion of the sealing plate, with the width of said projecting portion being gradually varied,
thereby to receive sufficient pressure on said projecting portion whereby the sealing plate is pressed against the side wall surface of the rotor with optimum pressure distribution over the entire length thereof.

3,893,506
DEVICE FOR THE ABSORPTION AND EMISSION OF HEAT

Nikolaus Laing, Hofener weg 35 bis 37, 7141 Aldingen near Stuttgart, Germany

Filed Sept. 15, 1972, Ser. No. 289,628
Claims priority, application Austria, Sept. 17, 1971, 8082/71
Int. Cl. F24d 11/00
U.S. Cl. 165—18 20 Claims



1. A combination of a building structure having an outer roof area facing the free space exterior of the structure and an inner area facing the interior of the structure and a device for the absorption of solar energy or emission of heat into the free space and for thermally conditioning the inner area, said device comprising a large surface first element forming part of said roof area and having therein a plurality of fluid channels connected in parallel in good heat conducting contact with said first element, a large surface second element forming a part of said inner area having a plurality of fluid channels connected in parallel in good heat contact with said second

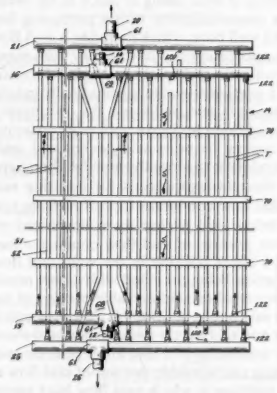
element, a heat storage body associated with one of said elements whereby heat may be transferred between the one element and said heat storage body, a saturated vapor of a heat carrying fluid and a condensate of said vapor contained within said channels, piping means connecting the channels of said first element with the channels of said second element whereby heat may be transferred between said elements by said saturated vapor when one of said elements acts as a heat source and the other said element acts as a heat sink, and a conveying device for conveying condensate of the heat carrying fluid from said second element to said first element through said channels when said device is absorbing solar energy.

3,893,507

APPARATUS FOR CREATING AND MAINTAINING AN ICE SLAB

Calvin D. MacCracken, Fort Lee, and Helmut J. Schmidt, Oakland, both of N.J., assignors to Calmac Manufacturing Corporation, Englewood, N.J.

Division of Ser. No. 204,112, Dec. 2, 1971, Pat. No. 3,751,935. This application Aug. 9, 1973, Ser. No. 387,148
Int. Cl. F28f 7/00; A63c 19/10
U.S. Cl. 165—46 **6 Claims**



1. A flexible portable plastic tubing mat adapted to be laid side-by-side with other similar mats for creating and maintaining an ice slab for skating and for preventing snow from melting on a ski slope and adapted to be laid end-to-end with other similar mats for creating an ice chute or trough for a toboggan slide or similar sliding purposes,

a. said portable mat having a length many times greater than its width with a plurality of small diameter flexible plastic tubing members extending lengthwise of said mat adapted to have cooled anti-freeze liquid pumped therethrough,

b. said flexible plastic tubing members having an inside diameter in the range from one-eighth to three-eighth of an inch,

c. securing means connected to said tubing members for securing them in a grid pattern in said mat,

d. said mat including supply and return sub-headers extending across one end of said mat with the ends of a plurality of said tubing members being connected respectively to said supply and return sub-headers with the direction of flow of the anti-freeze liquid being opposite in neighboring tubing members in the mat,

e. said flexible portable mat being rollable into a roll for ease of transportation, and

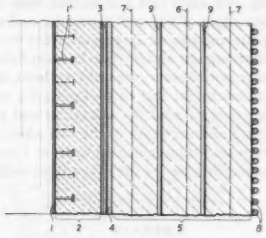
f. said sub-headers being adapted to be connected to main headers in an installation for interconnecting the plurality of said tubing members through the subheaders to the main headers.

3,893,508

PRESSURE VESSEL

Josef Német, Badenwein, Austria, assignor to Reaktorbau Forschungs- und Baugesellschaft m.b.H. & Co. OHG, Seibersdorf, Austria

Filed July 26, 1972, Ser. No. 275,326
Claims priority, application Austria, July 30, 1971, A6661/71
Int. Cl. F28f 13/00
U.S. Cl. 165—136 **11 Claims**



1. A pressure vessel for use in containing a high pressure, high temperature fluid medium, comprising:

an inner steel sealing layer having a high heat-resistant characteristic;

an outer supporting, prestressed concrete, layer encircling said inner sealing layer and being spaced from said inner sealing layer to define a space therebetween;

thermal insulating and pressure transmitting layer means positioned between said inner sealing layer and said outer supporting layer, said insulating layer means being free of expansion joints and made of a material which has a higher heat insulative characteristic than said outer support layer, said insulating and pressure-transmitting layer means continuously and directly engaging said inner sealing layer over the entire interface; and

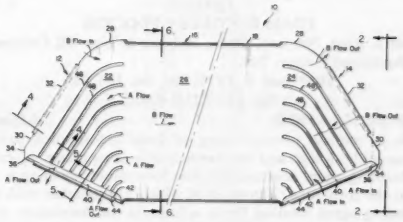
at least one temperature control system for controlling the temperature in at least one of said insulating layer means and said outer supporting layer.

3,893,509

LAP JOINT TUBE PLATE HEAT EXCHANGER

David L. Satchwell, Rolling Hills Estates, and Uriel F. Gardner, Redondo Beach, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Apr. 8, 1974, Ser. No. 459,250
Int. Cl. F28f 3/10
U.S. Cl. 165—166 **9 Claims**



1. A counter-flow plate type heat exchanger for two fluid media comprising:

a plurality of alternately stacked first and second plates, each plate having substantially triangular end portions with first and second adjacent sides each defining edges,

and third sides interconnected by a substantially rectangular intermediate portion having opposing edges;

depending flanges on said opposing edges of said first plates, said flanges including upper and lower first plate flange portions offset from each other to provide a shoulder;

depending flanges on said opposing edges of said second plates, said second plate flanges including upper and lower second plate flange portions offset from each other to provide a shoulder, the plurality of alternately stacked first and second plates being arranged such that second plate lower flange portions overlap said first plate upper flange portions and said first plate lower flange portions overlap said second plate upper flange portions;

means integral with each first and second plate for sealing said first side edges of adjacent triangular end portions of each first plate and one of the two adjacent second plates at each said triangular end portion to form fluid inlet and outlet passage portions for one fluid medium, and; means integral with each first and second plate for sealing said second side edges of adjacent triangular end portions of each first plate and the other of the two adjacent second plates at each said triangular end to form fluid inlet and outlet passage portions for the other fluid medium.

3,893,510

EMULSION METHOD OF INTRODUCING POLYMERS INTO A SUBTERRANEAN FORMATION

Eugene A. Elphingstone; Homer C. McLaughlin, and Charles W. Smith, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Aug. 12, 1974, Ser. No. 496,614
Int. Cl.[2] E21B *33/138, 43/22*
U.S. Cl. 166—295 **10 Claims**

1. A method of treating a subterranean formation to reduce the permeability of the formation to the flow of aqueous liquids therethrough, which comprises the steps of:

introducing a polymer containing treating composition into the subterranean formation, and

maintaining the treating composition in the subterranean formation until the polymers contained in the treating composition have been hydrated;

said polymer containing treating composition comprising a water-in-oil emulsion which comprises about 10 to 500 parts by weight oil per 100 parts by weight water, said water-in-oil emulsion having about 0.01 to 35 parts by weight particulated water soluble polymers per 100 parts by weight emulsion dispersed therein; said treating composition further comprising a homogeneous mixture of said water-in-oil emulsion with a carrier liquid which comprises about 10 to 70 parts by weight aqueous liquid and about 30 to 90 parts by weight liquid hydrocarbon per 100 parts by weight of said carrier liquid.

3,893,511

FOAM RECOVERY PROCESS

Paul J. Root, Norman, Okla., assignor to Sun Oil Company, Southland Center, Tex.

Filed June 9, 1971, Ser. No. 151,535
Int. Cl.[2] E21B *43/16*
U.S. Cl. 166—305 R **4 Claims**

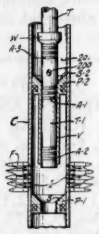
1. A method of recovering oil from a formation having zones of both high and low permeability comprising: injecting a foaming agent solution into the formation; injecting a gas into the formation, a portion of which gas together with the foaming agent solution forms a foam in the formation; continuing the injection of the gas and foaming agent until excessive pressures occur thereby allowing the remainder of the injected gas to enter the low permeability zone and go into solution with oil therein; and relieving the pressure on the formation without intermediate treatment thereof thereby producing fluid from the low permeability zone by solution gas drive.

3,893,512

METHOD AND APPARATUS FOR CONTROLLING FLOW FROM WELLS

Albert W. Carroll, and Phillip S. Sizer, both of Dallas, Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 143,879, May 17, 1971, abandoned. This application May 1, 1972, Ser. No. 249,212
Int. Cl. E21b *23/00*
U.S. Cl. 166—315 **6 Claims**



1. Apparatus for controlling flow of well fluids from a well having a string of well casing in place in the well, said casing having flow communication with a producing formation surrounding the well bore, which includes: a well flow conductor disposed in said casing and having flow inlet means providing flow communication with said producing formation and having at least a portion movable longitudinally in said well; a well packer disposed in said well above the communication of said casing and said flow conductor with said producing formation; means for sealing between said packer and said casing and said flow conductor to close the annulus therebetween against fluid flow therethrough; means for isolating said flow inlet means of said flow conductor from flow from said producing formation below said packer upon downward movement of said movable portion of said flow conductor from an upper position to a lower position in the well; said flow conductor movable portion being provided with a port positioned above said well packer when said movable portion of said flow conductor is in said upper position for flow into said casing above said packer and said port is sealed when said movable portion of said flow conductor is in said lower position; support means for supporting said movable portion of said flow conductor in said upper position in which said flow inlet means is open to permit fluid flow from said producing formation through said inlets means and to the surface in said well, said support means being operable between supporting and release conditions to permit controlled downward movement of said movable portion of said flow conductor to said lower position to close said flow inlet means to close off fluid flow from said producing formation.

3,893,513

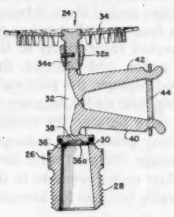
DISCHARGE HEAD AND FIRE PROTECTION SYSTEM UTILIZING SAID HEAD

William S. Marsh, Needham, Mass., assignor to Factory Mutual Research Corporation, Norwood, Mass.

Filed Sept. 9, 1974, Ser. No. 504,283
Int. Cl. A62c *37/08*
U.S. Cl. 169—16 **10 Claims**

1. A discharge head for use in a fire protection system comprising a body member for containing pressurized extinguishant, said body member having an inlet for connecting to a source of said extinguishant and an outlet for discharging said extinguishant, closure means for said outlet, linkage means for applying a force against said closure means greater than, and in an opposite direction to, the force of said extinguishant against said closure means to retain said closure means in an operative position relative to said outlet where it prevents the discharge of extinguishant from said outlet, said

linkage means adapted to respond to a predetermined fire condition in its vicinity for releasing its force, and adhesive means for securing said closure means in said operative position, said adhesive means adapted to release said closure means in response to the pressure of said extinguishant in said



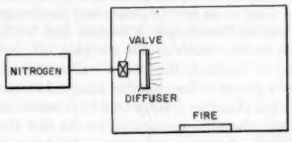
body member exceeding a predetermined value, said closure means being forced from said operative position by said extinguishant upon the existence of said fire condition and said predetermined extinguishant pressure to permit the discharge of said extinguishant from said outlet.

3,893,514

SUPPRESSION OF FIRES IN CONFINED SPACES BY PRESSURIZATION

Homer W. Carhart, Annandale; G. H. Fielding, Alexandria, and R. G. Gann, Springfield, all of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 23, 1973, Ser. No. 418,346
Int. Cl. A62c *1/14*
U.S. Cl. 169—46 **1 Claim**



1. A method of extinguishing a fire in a habitable space while maintaining an environment suitable for human sustenance and activity therein, which comprises:

sealing off the space to prevent gas escapement;

diffusing nitrogen gas at a pressure greater than ambient into said space initially at ambient pressure and uniformly mixing said nitrogen with the gases within said habitable space and

adding said diffused nitrogen gas into said confined space until the oxygen % by volume is from 10–15% with a partial pressure of oxygen of from 0.2–0.3 atmospheres with an increase in total gas pressure to 1.5 to 2.0 atmospheres;

whereby the reduced oxygen % by volume is sufficient to extinguish the fire and the partial pressure of oxygen is sufficient to sustain human life and permit work activity within the increased pressure environment.

3,893,515

ALL PURPOSE HOE AND DUSTER

Cecil Sadler, Rt. 10, Box 756, Tallahassee, Fla. 32304

Filed June 6, 1973, Ser. No. 367,453
Int. Cl. A01b *33/00*
U.S. Cl. 172—60 **2 Claims**

1. A cultivating attachment, comprising, in combination:

a. a frame;

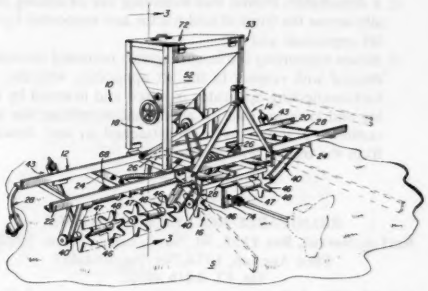
b. means mounted on the frame for moving earth in an area traversed by the frame, the means for moving earth including:

i. a rotatably mounted main shaft arranged on the frame for selective rotation;

ii. a plurality of mandrel shafts arranged spaced from and substantially parallel to the main shaft;

iii. belt means associated with all of the mandrel shafts for transmitting power from the main shaft to the mandrel shafts;

iv. a plurality of hoe blades, each mandrel shaft having a plurality of hoe blades mounted thereon; and



v. means for mounting the hoe blades on associated mandrel shafts for rotation therewith, the means for mounting including spacers associated with the blades for maintaining a predetermined spacing between them, bearing arm assemblies arranged for mounting the mandrel shafts, the mandrel shafts divided into pairs, with each pair mounted on associated bearing arms and arranged extending coaxially toward one another, and spring-biased braces forming portions of the bearing arm assemblies for permitting a cushioned movement of each bearing arm assembly and providing each mandrel shaft with a shock-absorbing assembly arrangement; and

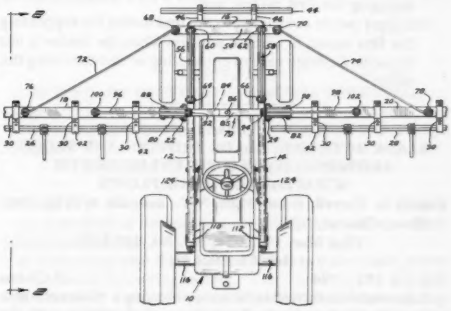
c. a plurality of rakes mounted on the bearing arm assemblies and arranged rearwardly of and adjacent to the hoe blades.

3,893,516

TOOL CONNECTING APPARATUS FOR TRACTORS

Emil F. Zimmerman, Richardton, N. Dak. 58652

Continuation-in-part of Ser. No. 380,209, July 18, 1973, abandoned. This application Apr. 8, 1974, Ser. No. 458,670
Int. Cl.² A01B *51/00, 63/102*
U.S. Cl. 172—273 **10 Claims**



1. Tool-connecting apparatus for mounting on a tractor provided with a hydraulically-actuated lift apparatus having

co-acting lifting arms pivotally attached to the rear of the tractor for upward and downward swinging movement and extending forwardly along the sides of the tractor and joined forwardly thereof by a transverse lifting beam, said tool-connecting apparatus being borne by the tractor solely through said lift apparatus and comprising:

a. a pair of longitudinal booms respectively extending transversely outwardly at the sides of the tractor rearwardly of the front wheels and having inner ends removably attached respectively to said lifting arms intermediate the length of the tractor;

b. a pair of longitudinal tool-mounting bars attached respectively to said booms in parallel relationship thereto;

c. a detachable, frontal tool-mounting bar extending laterally across the front of said tractor and supported by said lift apparatus; and

d. means supporting the booms against rearward movement thereof with respect to the lift apparatus; whereby said tool-connecting apparatus is raised and lowered by raising and lowering said lift apparatus, permitting the tool-connecting apparatus to be attached to and detached from the tractor with ease.

3,893,517

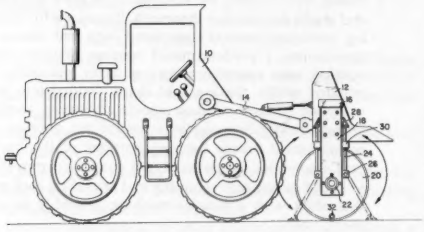
REMOVABLE ROLLER FOR LOADER

Karl A. Norvell, Box 1135, Rt. No. 1, Libby, Mont. 59923

Filed Apr. 26, 1974, Ser. No. 464,457

Int. Cl. A01b *49/02*

U.S. Cl. 172—438 **3 Claims**



1. In combination with a vehicular loader having a bucket secured to support arms whereby the bucket can be raised or lowered:

a horizontal hollow roller having an axle extending transversely to the longitudinal axis of the loader, said roller having filler and drain plug means whereby the roller can be filled with water or emptied;

first roller support means secured to the sides of the bucket and extending below the bottom of the bucket;

second support means connected to the roller to be freely rotatable about its own axis, the second means detachably engaging the first means; and

outrigger means connected to the first means for supporting the first means in vertical position when the loader is not in use to facilitate ease of connecting or disconnecting the roller.

3,893,518

BLADE ROTATING, BLADE TRIPPING AND SHOCK ABSORBING HYDRAULIC CYLINDER FOR SCRAPER-TYPE SNOW PLOWS

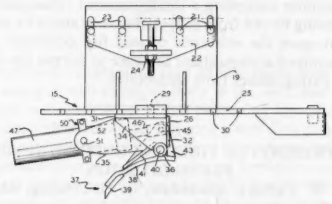
Eugene A. Farrell, Evans Mills, N.Y., assignor to Frink Sno-Plows, Clayton, N.Y.

Filed Mar. 11, 1974, Ser. No. 449,857

Int. Cl. E02f *3/12*

U.S. Cl. 172—794 **3 Claims**

1. In a vehicle carried snow scraper having a blade rotatable in one direction to a raised position out of contact with the road and rotatable in a reverse direction to a lowered position in contact with the road, motor means for rotating the blade, comprising: a fluid reservoir and a source of fluid under pressure, at least one hydraulic cylinder oscillatably secured to a scraper portion fixed to the vehicle, the cylinder having a piston therein fixed to one end of a piston rod, a second floating piston through which the rod is slideable, the pistons being resiliently spaced by a compression coil spring around the rod, passages into the cylinder at the fixed piston end and at the floating piston end, the blade having ear means projecting therefrom, the other end of the rod being pivotally secured to the ear means, a four way pilot valve; tubular lines from the pilot valve connected respectively to the source of pressure fluid, the fixed piston end passage, the reservoir, and the floating piston end passage; the pilot valve having a first position for connecting fluid under pressure to the fixed piston end passage by one valve passage for raising the blade and connecting the floating piston end passage to the reservoir by another valve passage, the pilot valve having a second position for connecting fluid under pressure to the floating piston end passage by one valve passage for lowering the blade and con-



necting the fixed piston end passage to the reservoir by another valve passage, the line from the pilot valve to the floating piston end passage including a hydraulic relief valve and a pilot operated check valve in that order connected therein, the relief valve having a cracking pressure chosen to turn the blade into contact with the road and to apply sufficient pressure to the road so as to compress the cylinder spring to substantially half its free length, a tubular line leading from the relief valve to the reservoir for carrying off fluid when the relief valve is cracked, the check valve having a chamber therein and a piston in the chamber adapted to open the check valve when the chamber is subjected to pressure, and a tubular line from the chamber connected to the line from the pilot valve to the fixed piston end passage for opening the check valve when the blade is raised, whereby the blade is raised when the pilot valve is moved to its first position and the blade is lowered and spring loaded when the pilot valve is moved to its second position and the cylinder acts as a shock absorbing trip for the blade when it meets an obstruction thereby further compressing the cylinder spring.

3,893,519

SLIDE BALL JOINTS AND BULLDOZER FRAME EMPLOYING SAME

Jack M. Deli, Wheaton, and William P. Macarus, Palos Park, both of Ill., assignors to International Harvester Company, Chicago, Ill.

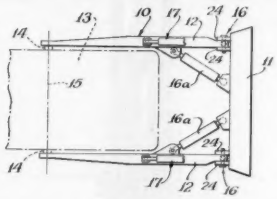
Filed July 13, 1973, Ser. No. 378,847

Int. Cl.[2] E02F *3/76*

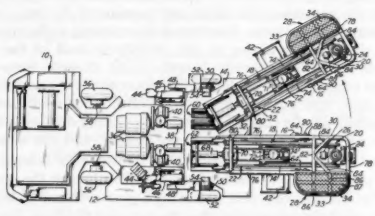
U.S. Cl. 172—803 **6 Claims**

1. An assembly comprising a bulldozer blade, push arms having ends adjacent end portions of the bulldozer blade, diagonal struts provided with screw threaded connections between the ends of the struts for individual adjustment of each of same to a fixed strut length, and connecting regions of the push arms and the bulldozer blade spaced from said end portions of the bulldozer blade and said ends of the push arms, means comprising power unit means connecting the push arms with the bulldozer blade for tilting the same, and joints between said ends of the push arms and said end portions of the

bulldozer blade accommodating the tendency of the angles between the push arms and the bulldozer blade to change with tilting of the bulldozer blade and the tendency of the diagonal struts to resist such change, each joint comprising a cross pin carried by medial and lateral pin-mounting-means on one of the bulldozer blade and the associated push arm, a ball part encountering predetermined clearance between the associated medial and lateral pin-mounting-means, and mounted on the pin, said ball part capable of predetermined limited movement to slide with respect to the pin between the pin-mounting-means and along the pin access, and a socket part connected to the other of the bulldozer blade and the associated push arm and receiving the ball part in a spherical connection, one of said joints in initial installation with the blade horizontal being without clearance between the associated push arm end and the medial lug, and having said predetermined clearance established between the associated push arm end and the lateral lug, the other joint being similarly without medial clearance and having as lateral clearance said predetermined clearance, all in the interest of automatic stress relief during blade tilt.

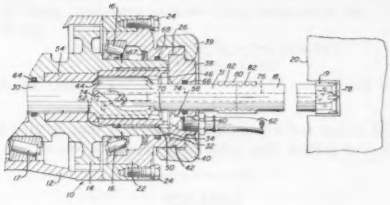


3,893,520
CANOPY ASSEMBLY FOR A DUAL BOOM DRILL
Thomas W. McCormick, Morgantown, W. Va., assignor to FMC Corporation, Fairmont, W. Va.
Filed Jan. 21, 1974, Ser. No. 435,196
Int. Cl. E21c *11/02*
U.S. Cl. 173—34 **12 Claims**



1. A canopy for a dual boom drill comprising,
a mobile body having a horizontal platform,
drill means,
a forwardly extending frame pivotally mounted to said horizontal platform,
a boom assembly having front end and rear end portions, said boom assembly rear end portion pivotally secured to said forwardly extending frame to permit movement of said drill means supported by said boom assembly front end portion in a vertical plane,
a canopy assembly having front end and rear end portions maintained in overlying relationship with said forwardly extending frame,
extensible means for moving said canopy assembly front end portion in a linear vertical path to a preselected height above said frame, and
articulating means for connecting said canopy assembly rear end portion to said forwardly extending frame.

3,893,521
ROCK DRILL
Edward A. Bailey, Newport, and Louis H. LeBlanc, Jr., Claremont, both of N.H., assignors to Joy Manufacturing Company, Pittsburgh, Pa.
Filed Jan. 30, 1974, Ser. No. 437,913
Int. Cl. B25d *9/00*
U.S. Cl. 173—80 **5 Claims**



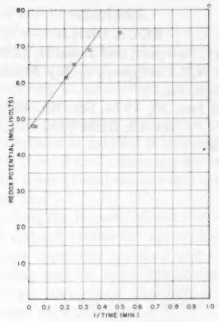
1. In an elongated percussively actuated rock drill wherein a piston member repetitively engages an elongated striking bar within a body member, the improvement comprising: a chamber defined intermediate said striking bar and said body member; sealing means cooperable with said body member and said striking bar to restrict flow from said chamber; said striking bar including forward and rear bearing portions and a splined driver portion located axially intermediate said bearing portion; first longitudinally extending forwardly open passageway means in said striking bar having the rearward end thereof terminating intermediate the axial ends of said striking bar; second passageway means in said striking bar and communicating between said first passageway means and said chamber; said second passageway means including at least one transversely extending bore having the outer end thereof in communication with said chamber adjacent a root surface of a respective one of the splines of said driver portion; and third passageway means having one end thereof communicating with said chamber and having the other end thereof adapted to communicate with a fluid flow source.

3,893,522
METHOD OF DETERMINING REDOX POTENTIAL
Walter H. Fertl, and Paul J. Zuvanich, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.
Filed June 27, 1973, Ser. No. 374,206
Int. Cl. E21b *47/00*
U.S. Cl. 175—50 **5 Claims**

1. A method of determining the redox potential of a fluid system comprising:
a. contacting said fluid system with a two electrode redox potential measuring system,
b. observing the redox potential values after the measuring system is in contact with the fluid system for four minutes and for 5 minutes,
c. plotting on linear graph paper the observed redox poten-

tial versus the time factor 1/time, and

d. drawing a straight line through the plotted redox potential values and extrapolating to infinite time to give the desired infinite time value of the redox potential.

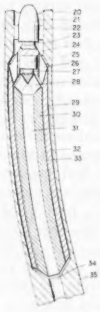


3,893,523

CURVABLE PIPE SECTION

John Doise Jeter, Midland, Tex., assignor to Texas Dynamatics Inc., Dallas, Tex.

Filed Nov. 15, 1973, Ser. No. 416,086
Int. Cl. E21b *7/08*
U.S. Cl. 175—74 **5 Claims**



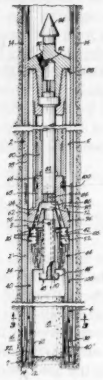
1. A curvable drill pipe section carried by a pipe string extending into a well bore that can be actuated to change the radius of curvatures of the longitudinal centerline of the section comprising; an inherently curved tubular outer member, an inherently curved cylindrical inner member axially supported and radially constrained within the bore of said tubular outer member such that the longitudinal centerline of the inner member is generally coincident with the longitudinal centerline of said outer member for relative rotation and relative rotational positioning within said outer member, means to rotate said inner member relative to said outer member, means to lock said inner member in selected rotational position relative to said outer member, so that by changing the rotational position of said inner member relative to said outer member said inner member will strain said outer member to change the curvature of the longitudinal centerline of the section.

3,893,524

ROTARY DRILL ROD

Gerald T. Sweeney, Federal Way, Wash., assignor to Tigre Tierra, Inc., Puyallup, Wash.

Division of Ser. No. 283,208, Aug. 23, 1972, Pat. No. 3,854,539. This application June 3, 1974, Ser. No. 475,598
Int. Cl.² E21B *5/00*
U.S. Cl. 175—92 **9 Claims**



1. A rotary drill rod comprising an elongated pipe having a longitudinally extending bore therethrough and an annular bit at the distal end thereof, the proximal end portion of the bore being adapted to slidably receive a piston-like means therein, but there being an annular shoulder about the periphery of the bore at the terminus of said portion to engage the means in the rod adjacent the bit, and means defining an annular seat about the periphery of the bore between the shoulder and the mouth of the bit, which is of lesser inside diameter than that of the shoulder, to engage an elongated member which is slidably inserted into the distal end portion of the bore through the opening of the shoulder when the piston-like means is engaged with the shoulder, the distal end portion of the bore having substantially the same diameter as the opening in the shoulder, but there being fluting in the peripheral wall of the bore, which extends generally longitudinally thereof between a point adjacent the shoulder and a point about the periphery of the seat, and porting in the body of the bit, which extends generally axially thereof between the fluting and the working face of the bit at the distal end thereof, to form a passage about the member through which fluid can be released into the working face of the bit from a point adjacent the opposite end of the member, said bit having a greater diameter than the pipe and being adapted so that the released fluid can discharge from the face of the bit toward the proximal end of the pipe on the opposite side of the pipe from the member.

3,893,525

DRILLING CONTROL TRANSFER SYSTEMS

Ethell J. Dower; Lester L. Cain, and Hubert Irvin Smith, all of Houston, Tex., assignors to Drill-Au-Mation, Inc., Houston, Tex.

Filed Oct. 4, 1973, Ser. No. 403,345
Int. Cl. E21b *3/12*
U.S. Cl. 175—24 **24 Claims**

1. A system for controlling drilling operations interchangeably between a remote control location and a manual control location on a drilling rig comprising:

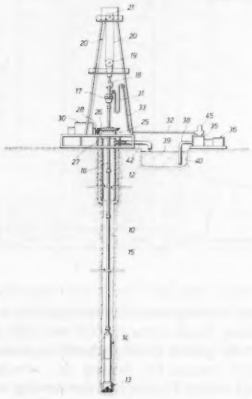
means on a drilling rig responsive to a control input means for developing a drilling operation parameter;

first manual control input means on a drilling rig for producing a first control function for controlling the operation of said developing means;

first translation means for coupling said first manual control input means to said developing means and for providing a control input for said developing means in response to said first control function;

second control input means at a location remote to a drilling rig for producing a second control function for controlling the operation of said developing means;

second translation means for coupling said second remote control input means to said developing means and for



providing a control input for said developing means in response to said second control function;

means for selectively coupling one of said translation means to said developing means; and

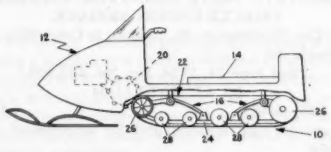
means for comparing the magnitude of said control inputs for said developing means and for producing an indication of the difference between said control inputs thereby permitting an adjustment of one control input means relative to the other control input means to bring said control functions into parity for facilitating a bumpless transfer of said control functions whenever said selective coupling means is operated.

3,893,526

TRACK ASSEMBLY FOR SNOWMOBILES

Richard E. Esch, Sparta, Mich., assignor to C. L. Frost & Son, Inc., Grand Rapids, Mich.

Filed July 30, 1973, Ser. No. 383,690
Int. Cl. B62d *57/02*
U.S. Cl. 180—5 R **33 Claims**



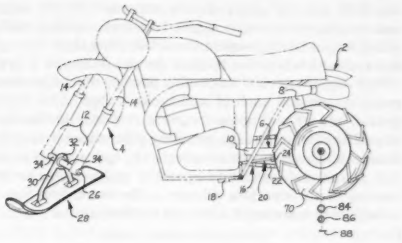
1. Apparatus for movably supporting tracked vehicles including snowmobiles and the like including a pair of elongated, parallel frame members, a pair of idler wheels generally adjacent either end of said frame members, and a flexible, endless track extending longitudinally around said frame members and supported for movement therearound on said idler wheels; each of said frame members including at least one pair of bogie wheels and means for mounting each of said pairs of bogie wheels relative to one of said frame members; said bogie wheels in each pair mounted coaxially with each other adjacent opposite sides of and intermediate the ends of said respective frame members longitudinally between said pairs of idler wheels; each of said pairs of bogie wheels spacing a portion of said track adjacent said bogie wheels a predetermined distance beneath the respective one of said frame members for support of said vehicle above a supporting surface portions of said track being engageable intermittently with said rails during use thereof; said pairs of bogie wheels being secured at spaced intervals along each of said frame members whereby uneven wearing of the frame members by uneven contact with said track is prevented.

3,893,527

MEANS AND TECHNIQUE FOR CONVERTING A MOTORCYCLE TO A SNOWMOBILE

Milo C. Walker, Seattle, and Robert M. Bradford, Brier, both of Wash., assignors to Snow-King Enterprises, Inc., Brier, Wash.

Filed June 4, 1973, Ser. No. 366,742
Int. Cl. B62m *13/00*
U.S. Cl. 180—6 A **18 Claims**



1. In combination with a motorcycle body having front and rear yokes thereon, normally for mounting tandem ground-engaging wheels inboard between the respective arms thereof, and a chain and sprocket drive mechanism thereon, normally for driving the rear inboard ground-engaging wheel thereof, a modified ground engaging assembly comprising a pair of apertured axle mounting blocks releasably slidably engaged with the end portions of the arms of the rear yoke so as to assume fixed orientations thereon in which the apertures of the blocks are mutually opposed to one another across the rear yoke, means releasably clamping the blocks to the arms of the rear yoke in said orientations, axle means rotatably supported in the apertures of the blocks and projecting laterally outboard therefrom, ground engaging elements on the yokes including a pair of wheels fixed to the laterally projecting outboard portions of the axle means to rotate in conjunction therewith, and a sprocket fixed on the axle means and engaged within the chain of the drive mechanism to rotate the axle means under the power thereof, said clamping means including pin and slot connections between the blocks and the end portions of the arms of the rear yoke, the slots of which connections are elongated lengthwise of the drive mechanism to enable the chain to be tightened by sliding the blocks in relation to the arms of the rear yoke when the clamping means are released.

3,893,528

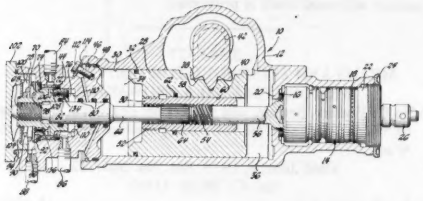
FRONT BRAKE STEERING ASSIST

Frederick L. J. Rehfeld, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 17, 1974, Ser. No. 506,699
Int. Cl. B62d *5/06*
U.S. Cl. 180—6.3 **4 Claims**

1. In a vehicle having a pair of steerable road wheels, independently operable hydraulically actuated brake means asso-

ciated with each of said road wheels respectively for retarding rotation of each of said road wheels selectively, and steering means including linkage means interconnecting said road wheels for simultaneously controlling the position of the latter in unison and relative to said vehicle to thereby control the direction of motion of said vehicle and a manually rotatable steering shaft operatively connected to said linkage means, the combination comprising; hydraulic pump means operatively connected to each of said independently operable brake means respectively for operating said brake means for the wheels, respectively, drive means disposed between said steering shaft and said pump means responsive to the magnitude and direction of torque applied to said steering shaft, said pump means being coupled to said steering shaft through said drive means when the applied torque achieves a predetermined magnitude, and respective passage means between said pump means and each of said brake means to be selectively pressurized by said pump means in response to the direction of said applied torque for directing pressurized hydraulic fluid from said pump means to selectively operate the respective one of said independently operable brake means to enforce turning of the steerable wheels in the same direction as the vehicle turn associated with said applied torque.



3,893,529

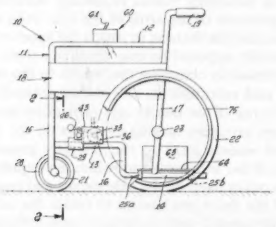
WHEELCHAIR DRIVE PACKAGE

Andrew Karchak, Jr., 9530 Ardine St., and James R. Allen, 10418 Chaney Ave., both of Downey, Calif. 90241

Filed Apr. 22, 1974, Ser. No. 462,666

Int. Cl. B62d *11/04*

U.S. Cl. 180—6.5 **8 Claims**



1. A drive assembly adapted for connection onto a wheelchair to drive the chair relatively large wheels, said assembly comprising,

a. supports to be carried on the chair and a horizontal mounting bar of a length to be removably received by the supports, each support having a recess for reception of the bar,

b. drive means carried on the bar and including a pair of drive rotors, and

c. clamping means carried on the bar for urging the drive means relatively about an axis parallel to the bar to effect clamping engagement of the rotors with the peripheries of the wheels, respectively, the clamping means transmitting force to the drive means in offset relation to said axis and including rotatably adjustable members engageable with housings defined by the drive means, and rotatable to effect said urging, the rotors having axes offset from said axis which is defined by the bar.

3,893,530

FLOOR TREATING MACHINES

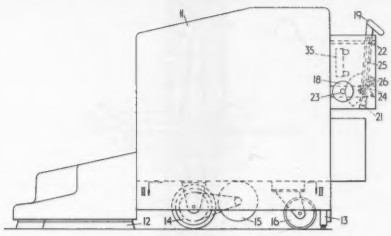
Sidney Gordon, Stanmore, England, assignor to R. G. Dixon & Company Limited, Wembley, England

Filed Sept. 10, 1973, Ser. No. 395,551

Claims priority, application United Kingdom, Sept. 12, 1972, 42345/72

Int. Cl. B62d *11/04*, *51/04*

U.S. Cl. 180—6.5 **2 Claims**



1. A floor treating machine comprising a body, a floor engaging rotary brush mounted for rotation on said body, a pair of laterally spaced driving wheels mounted on said body, electric motor means for driving the wheels, independent speed control means for each of the driving wheels, a pair of independently movable, manually operable control arms pivotally mounted in a swivel joint at one end thereof to move on parallel axes side-by-side on the machine, spring means loading each of the control arms to an off position, an individual electrical voltage control component mechanically and drivably connected to each of the control arms, each of the electrical control components forming part of the speed control means for a separate one of the said driving wheels, a common handle operatively connected between each of the control arms at a point removed from the pivotal mounting to give either conjoint synchronised movement or differential movement thereof, whereby synchronised movement of the control member provides equal adjustment of the wheel speeds and differential movement of the control members provides differential adjustment of the wheel speeds to give a steering effect and reversing switch means for the motor means located adjacent each control arm with each control arm being arranged to operate the reversing switch means when moved in an opposite direction from the off position.

3,893,531

HYDROSTATIC DRIVE MEANS FOR AMPHIBIOUS VEHICLE UNDERCARRIAGE

James E. Gee, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 24, 1974, Ser. No. 482,509

Int. Cl.[2] B62D *11/04*

U.S. Cl. 180—6.48 **4 Claims**

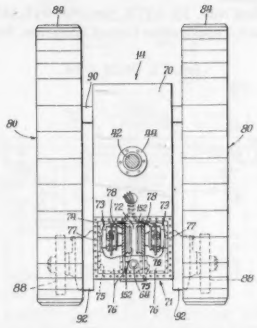
1. A crawler-type traction unit for amphibious vehicles comprising:

a pair of generally parallel track frames;

a pair of track chains, one for each track frame, trained about an associated track frame for movement therearound;

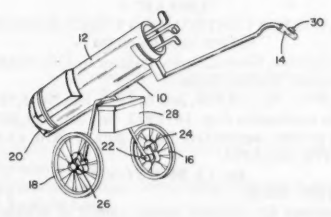
a gear case interconnecting said track frames and having a central chamber flanked by two "steering clutch" chambers each having openings to said central chamber and to an associated one of said track frames, said "steering clutch" chambers otherwise being sealed;

a pair of hydraulic motors, one in each "steering clutch" chamber and each having a rotatable output shaft;
means establishing a driving connection from each of said hydraulic motors to the track chain on the associated track chain through the opening thereto;
means establishing a seal about each of said driving connections for precluding entry of foreign matter therearound into the associated "steering clutch" chambers;



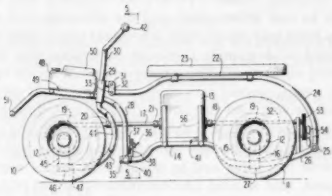
a pair of diaphragm means, one for each "steering clutch" chamber, sealingly closing the associated opening to said central chamber; and
a body of liquid within and filling each "steering clutch" chamber,
whereby pressures external of said "steering clutch" chambers are transmitted to the interiors thereof.

3,893,532
POWER ASSISTED GOLF CART
Paul R. Perlowin, Concord, Calif., assignor to Panpacific Recreational Products, Concord, Calif.
Filed Apr. 29, 1974, Ser. No. 464,868
Int. Cl. B62d *51/04*
U.S. Cl. 180—19 R **6 Claims**



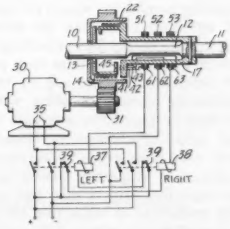
1. In a manually operated golf cart comprising a frame for supporting a golf bag in a position inclined from vertical, said frame having a lower portion adapted to abut the ground when the cart is at rest to partially support said golf bag, and a pair of spaced wheels rotatably attached to the frame to provide the support for said frame when the cart is in motion, the improvement comprising:
a pair of electric motor means located adjacent the respective wheels; and
a pair of drive train means connecting each electric motor means to its adjacent wheel respectively for driving said wheel with said motor, each said drive train means including an elastic drive belt to insulate each electric motor means from its associated wheel so that shocks on the wheels are at least partially insulated from the electric motor means.

3,893,533
RECREATIONAL VEHICLE
Hubert Tidwell, Box 57, Wellington, Utah 84542
Filed Jan. 25, 1974, Ser. No. 436,785
Int. Cl. B62k *11/04*
U.S. Cl. 180—31 **5 Claims**



1. A vehicle comprising forward and rear dual wheel assemblies, a lower vehicle frame section and a separately formed upper frame section, a yoke including a generally upright steering shaft bearing, a longitudinal axis swivel bearing carried by the bottom of the yoke and rotatably receiving the forward end of said lower frame section, means forming a transverse axis pivotal connection between the rear extremity of the lower frame section and the rear end of the upper frame section, an engine mounted on the lower frame section between said forward and rear dual wheel assemblies, fore and aft longitudinal drive shafts connected with and driven by the engine and drivingly connected with said forward and rear dual wheel assemblies, a front steering fork for the vehicle including an upper shaft portion engaged rotatably within said steering shaft bearing and also including a lower longitudinal axis forward extension, a forward bracket carrying the forward dual wheel assembly rotatably and having a lower end longitudinal axis swivel bearing rotatably receiving said lower longitudinal axis forward extension, a rear bracket carrying the rear dual wheel assembly rotatably and having a lower end longitudinal axis swivel bearing rotatably receiving said lower vehicle frame section, and a seat carried by said upper frame section.

3,893,534
SERVO AIDED STEERING SYSTEM
Helmut Steinmann, Baden-Baden, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany
Filed Feb. 27, 1974, Ser. No. 446,167
Claims priority, application Germany, Mar. 10, 1973, 2312009
Int. Cl. B62d *5/04*
U.S. Cl. 180—79.1 **7 Claims**



1. Servo aided steering system comprising:
a manually actuatable driving shaft (**10**);
a driven steering shaft (**11**);
torsion coupling means (**12**) for mechanically connecting said driving and driven shafts, while allowing relative displacement therebetween dependent on direction and amount of transmitted torque;

motor means (30–63) for aiding manual actuation, said motor means being responsive to the presence and direction of the first predetermined minimum amount of torque transmitted through said torsion coupling and being unenergized in the absence of said first predetermined minimum amount of torque, and

second coupling means (17–27) for coupling said motor means to said driven shaft and for releasing said motor means from said driven shaft when said torque falls below a second predetermined amount of torque, said second coupling means including a rotary element driven by said motor means coaxial with elements respectively mounted on and driving and driven shafts and including also at least one intermediate coupling element and being operable automatically by mechanical engagement and disengagement to couple and to release said motor means as aforesaid, said second predetermined amount of torque being determined by the deformability of at least one of said elements of said second coupling means in response to said relative displacement allowed by said torsion coupling means.

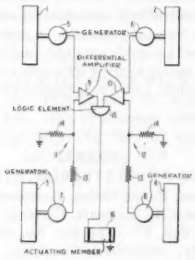
3,893,535
INSTALLATION FOR PREVENTING SPINNING OF THE DRIVEN WHEELS OF A MOTOR VEHICLE

Manfred H. Burckhardt, Waiblingen; Hans-Jorg Florus, Goppingen, and Horst Grossner, Geradstetten, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Division of Ser. No. 872,892, Oct. 31, 1969, Pat. No. 3,667,813. This application Mar. 21, 1972, Ser. No. 236,652

Int. Cl. B60q *1/00*

U.S. Cl. 180—82 R **14 Claims**



1. An installation for preventing the spinning of the driven wheels on a motor vehicle of the type having driven and non-driven wheels on each of two respective vehicle sides, said installation comprising monitoring means for determining the rotational speed differential between the driven and non-driven wheels and control means for controlling the rotational speed of the driven wheels in response to a predetermined rotational speed differential determined by the monitoring means; said monitoring means including wheel generator means for each wheel for producing a voltage corresponding to the rotational speed of a respective wheel, differential amplifier means for each vehicle side having inputs for accepting voltages produced by respective driven and non-driven wheels from the respective vehicle side, and voltage divider means operatively connected to respective driven wheel generator means for establishing a voltage difference corresponding to said predetermined rotational speed differential in the circuit between the respective driven wheel and its amplifier input, each of said differential amplifier means providing an output when the rotational speed differential between the driven wheel and the non-driven wheel of the corresponding side exceeds the predetermined rotational speed difference, wherein outputs of the respective differential amplifier means of both vehicle sides are operatively connected to an actuating means which reduces the engine torque in the presence of a signal in its input.

3,893,536
VEHICLE GUIDANCE SYSTEM OPERATING IN THE BANG BANG MODE

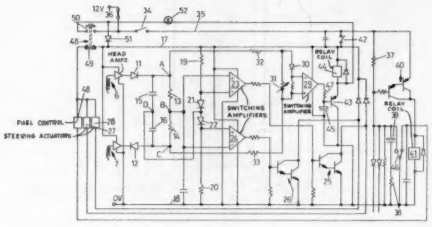
Leonard Marshall, Fleet, and David S. Hobday, Farnborough, both of England, assignors to E. R. A. Patents Limited, Surrey, England

Filed Nov. 13, 1973, Ser. No. 415,347

Claims priority, application United Kingdom, Nov. 14, 1972, 52586/72

Int. Cl. B62d *1/24*

U.S. Cl. 180—98 **14 Claims**



1. A guidance system for operating a steering mechanism of a vehicle for guiding the vehicle along a path defined by a guidance conductor, the system including means for sensing the deviation of the vehicle from the defined path; steering control means operable to activate said steering mechanism by a fixed amount selectively to the left or to the right about a datum condition; and means responsive to the sensed deviation to cause the steering control means to activate the steering mechanism by said fixed amount in the appropriate direction for correcting the deviation when said deviation exceeds a predetermined value, and to maintain the activation by said fixed amount until the deviation reduces below the predetermined value, the steering mechanism then being de-activated to the datum condition.

3,893,537
APPARATUS FOR CONTROL OF A VEHICLE CONSTANT SPEED MECHANISM

Naoji Sakakibara, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Division of Ser. No. 159,969, July 6, 1971, Pat. No. 3,752,252. This application Aug. 14, 1973, Ser. No. 388,303

Claims priority, application Japan, July 3, 1970, 45-58594; July 3, 1970, 45-58595

Int. Cl. B60k *31/00*

U.S. Cl. 180—105 E **2 Claims**

1. Apparatus for constant speed control of vehicle travel speed, comprising:

a throttle servo means,

a first electrical circuit providing an electrical signal responsive to actual vehicle speed,

means for establishing a desired vehicle speed,

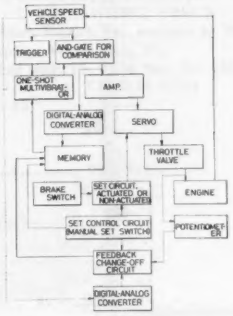
a second electrical circuit for providing a second electric signal responsive to the desired vehicle speed,

a third electrical circuit including a potentiometer for obtaining a negative feedback signal responsive to throttle valve opening degree, said third circuit being connected with said second circuit, for varying said desired vehicle speed,

a fourth electric circuit for providing an artificial throttle valve opening degree signal corresponding to the vehicle running condition when traveling on an even traffic surface at a speed equal to the said actual vehicle speed by modifying said first signal,

a fifth electric circuit for memorizing said second electric signal,

a sixth electric circuit for replacing said negative feedback signal from said third electric circuit with said artificial



throttle valve opening degree signal upon operation of said means, and

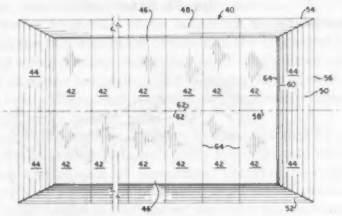
a seventh electric circuit for comparing said memorized signal in said fifth circuit with said first electric signal for the control of said throttle servo means.

3,893,538

GROUND EFFECTS VEHICLE AND AN AIR TERMINAL

J. Dale Thompson, deceased, late of Seattle, Wash., and Dorothy B. Thompson, executrix, 3265 41st. Southwest, Seattle, Wash. 98116

Filed Aug. 10, 1970, Ser. No. 62,307
Int. Cl. B60v *1/04, 3/00*
U.S. Cl. 180—117 **103 Claims**



1. An assembly of a primary section and a ramp section, said assembly comprising:

a. said primary section comprising a structural frame:

b. an air-tight base;

c. an upper surface deck;

d. a first means, free of contact with the surrounding area, for varying the elevation of said section;

e. said ramp section comprising a structural frame;

f. an upper surface deck;

g. a zero side;

h. a connection side;

i. a zero end;

j. a connection end;

k. said connection side being of greater thickness than said zero side;

l. said connection end varying in thickness from said connection side to said zero side;

m. said zero end being of substantially uniform thickness;

n. said connection side, in the vicinity of said zero end, varying in thickness from the average thickness of said connection side to the thickness of said zero end;

o. said zero side being of substantially uniform thickness;

p. means to join said primary section to said ramp section at said connection side; and

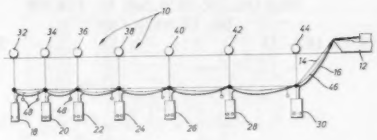
g. said first means comprising a source of compressed gas and a controlled release means for said gas for releasing said gas to said air-tight base.

3,893,539

MULTIPLE AIR GUN ARRAY OF VARIED SIZES WITH INDIVIDUAL SECONDARY OSCILLATION SUPPRESSION

Lewis M. Mott-Smith, Houston, Tex., assignor to Petty-Ray Geophysical, Inc., Houston, Tex.

Continuation of Ser. No. 291,881, Oct. 21, 1972, abandoned. This application Sept. 28, 1973, Ser. No. 401,856
Int. Cl. G01v *1/02*
U.S. Cl. 181—115 **11 Claims**



9. A method for generating an underwater seismic pulse having a signal-to-bubble ratio signature of at least eight-to-one, comprising the steps of:

placing a plurality of bubble generating devices of different sizes in spaced apart relationship, the devices being spaced apart sufficiently to prevent coalescence of adjacent bubbles;

simultaneously actuating the bubble generating devices to produce a like pluraltiy of initially expanding bubbles of correspondingly different maximum diameters; and

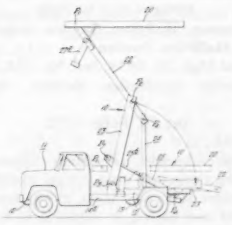
introducing a guantity of compressed gas into at least one of the bubbles as the bubble approaches its maximum diameter to suppress secondary oscillations thereof.

3,893,540

LIFTING MECHANISM

Robert A. Beucher, 216 Howarth Road, Media, Pa. 19063

Filed Dec. 7, 1973, Ser. No. 422,971
Int. Cl. B66f *11/04;* **B04g** *1/22*
U.S. Cl. 182—2 **14 Claims**



1. Load lifting apparatus, comprising:

a frame,

a compression member pivotally connected to said frame at one location,

an elongated boom pivotally connected to said compression member,

an elongated load support platform pivotally connected to one end of said boom and extending therefrom so as to overlie said boom and said frame for supporting a load moveable on the platform above the frame,

a rigid tension member pivotally connected to the other end of said boom and pivotally connected to said frame at another location spaced from said one location,

first actuator means connecting said compression member to said frame for pivoting the compression member and causing said tension member to pivot said boom relative to the compression member for raising and lowering said load support, and

second actuator means associated with said support and boom for pivoting said support relative to said boom to permit leveling of said support during raising and lowering thereof, whereby said load support platform may be raised and lowered upon extension and retraction of said first actuator means.

3,893,541

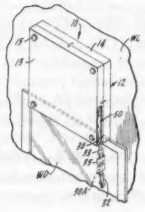
WINDOW ESCAPES

Donald A. Servais, 1823 32nd St., Kenosha, Wis. 53140

Filed Oct. 29, 1974, Ser. No. 518,495

Int. Cl. A62b *1/14*

U.S. Cl. 182—73 **5 Claims**



1. Apparatus facilitating escape from the window of an upper story dwelling comprising a housing, a reel inside the housing containing a wound length of life line, a body-support harness attached to the free end of the life line, shock absorber means comprising a rod and a fluid-charged cylinder together having opposed ends, one such end being anchored pivotally to the interior of the housing and the other end being pivotally attached in eccentric relation to the reel, and guide means secured in spaced relation to the interior of the housing and rotatably supporting the periphery of the reel.

3,893,542

COUNTERWEIGHT ARRANGEMENT FOR A RACK AND PINION ELEVATOR

Thorbjörn Svensson, Skelleftea, Sweden, assignor to Linden-Alimak AB, Skelleftea, Sweden

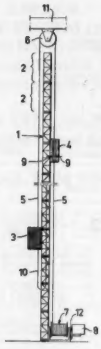
Filed Mar. 25, 1974, Ser. No. 454,536

Claims priority, application Sweden, Apr. 6, 1973, 7304892-8

Int. Cl. B66b *17/12*

U.S. Cl. 187—94 **6 Claims**

1. An elevator comprising a vertically oriented mast having a rack extending along said mast, a load carrier mounted for vertical movement along said mast, motor means carried by said load carrier and having an output gear in drive engagement with said rack for moving said load carrier along said mast, and counterweight means comprising a pulley mounted for rotation adjacent the top of said mast, a rotatable cable drum mounted at a fixed position adjacent the lower end of said mast, a counterweight cable attached at one of its ends to said load carrier and extending upwardly from said load carrier over said pulley and thence downwardly to said cable drum whereby the other end of said cable is always located at the lower end of said mast thereby to assure that the counterweight cable includes a section which always extends along the entire length of said mast on the side of said pulley opposite to said load carrier regardless of the position of said load carrier along said mast, said cable drum being operative to automatically take in and feed out said counterweight cable as



the vertical position of said load carrier is varied along said mast, and a counterweight attached to said counterweight cable section between said pulley and said cable drum.

3,893,543

RESILIENT STRUCTURE FOR DISC BRAKE FRICTION PAD

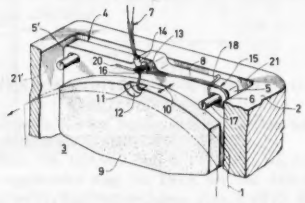
Juichi Sibatani; Sadayoshi Itou; Masachika Yamamoto, and Mithuhiko Nakagawa, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka and Toyota Motor Co., Ltd., Aichi, both of, Japan

Filed Oct. 23, 1973, Ser. No. 408,909

Claims priority, application Japan, Oct. 21, 1972, 47-121891

Int. Cl. F16d *66/02*

U.S. Cl. 188—1 A **7 Claims**



1. In a disc brake assembly wherein: a friction pad is mounted for limited movement toward and away from a rotating brake disc in a direction parallel to the axis of disc rotation and between laterally spaced guide surfaces of a fixed guide member, and wherein an insulated wire is loop coupled to the movable brake friction pad and a resilient member is mounted on the back plate of the movable friction pad and engages the insulated wire to move at least one portion of the loop away from the back plate upon severance of the wire by brake pad wear, the improvement wherein: said resilient member comprises: a resilient guide member pressor which protrudes laterally from one side of the back plate and laterally engages one of said laterally spaced guide surfaces for biasing the other side of said back plate into contact with the other guide surface to eliminate squeal when applying the brake, and said resilient member further comprises a unitary resilient arm, said arm engaging said insulated wire loop and exerting a tensioning force thereon to bias said wire loop radially outwards relative to the axis of rotation of said brake disc such that the resilient arm carries the loop portion of said insulated

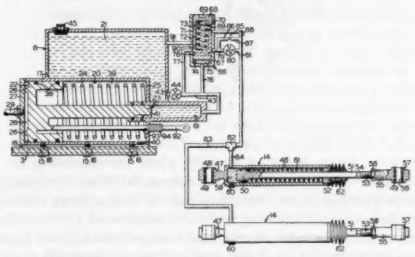
wire radially outwards of said brake disc when loop severance occurs.

3,893,544

PNEUMATIC-HYDRAULIC BRAKE APPARATUS FOR A FOUR-WHEEL TRUCK

Donald C. Means, Export, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Mar. 13, 1974, Ser. No. 450,871
Int. Cl. B61h *13/24*
U.S. Cl. 188—52 **11 Claims**



1. A brake rigging for a four-wheel type of railway vehicle truck having two spaced-apart side frames disposed on opposite sides of a longitudinal axis and each perpendicular to a transverse axis of the truck, said brake rigging comprising:

a. two brake-shoe-carrying brake beams extending in spaced substantially parallel relation to the transverse axis of the vehicle truck, and guidably supported at the ends thereof on the side frames of the truck for bodily movement longitudinally of the truck, each of said brake beams having adjacent each end thereof a cavity out of which extends in opposite directions a pair of coaxial bores, wherein the improvement comprises,

b. a pair of hydraulic brake actuators each disposed between the two wheels on one side of the truck and having a pair of oppositely extending arms, the pair of arms of each actuator being disposed in the cavities at one end of said brake beams and respectively operatively connected to said brake beams, and

c. a hydraulic-pneumatic master cylinder carried by one of said brake beams and operatively responsive to the application and release of pneumatic pressure to cause the supply and release of hydraulic fluid under pressure to and from said brake actuators whereby said actuators, in response to said supply of hydraulic fluid under pressure thereto, effect movement of said brake beams in opposite directions to a brake applying position with respect to said wheels of the truck.

3,893,545

MECHANICAL ACTUATOR FOR DISC BRAKE

Richard T. Burnett, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Oct. 25, 1973, Ser. No. 409,490
Int. Cl. F16d *55/26*
U.S. Cl. 188—72.6 **5 Claims**

1. In a brake:

a rotor having a pair of friction faces;

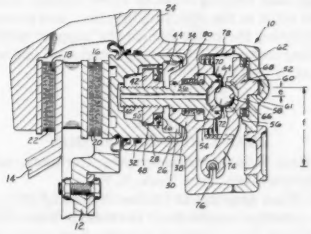
a pair of friction elements, one of said elements being disposed adjacent each of said friction faces;

a stationary torque member;

a caliper housing slidably mounted on said torque member and having portions disposed adjacent each of said friction elements for urging the latter into frictional engagement with the corresponding friction faces when a brake application is effected;

said caliper housing defining a bore therewithin, fluid pressure responsive means within said bore for effecting a service brake actuation, and mechanical actuating means for effecting a mechanical actuation of said brake;

said mechanical actuating means including a force transmitting member operably connected to one of said friction elements, a pair of mating recessed sockets, each of said sockets having an axis, said sockets carried on said force transmitting member and on said housing respectively, said sockets cooperating with each other to define a cavity therebetween, a substantially spherical force transmitting element disposed in the cavity defined by said sockets, one of said sockets being mounted coaxial with said force transmitting member, and pin means for



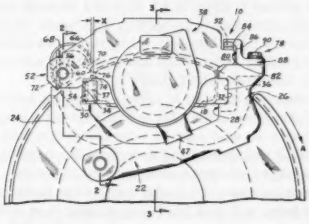
mounting the other socket for rotative movement about an axis offset from the axis of the one socket, the offset between said axes being less than the sum of the radius of the spherical force transmitting element and the radius of said pin means, and lever means for rotating said other socket about said pin means from a neutral position wherein the other socket is aligned with the one socket to an actuated position wherein the other socket is displaced from the one socket, said force transmitting element being urged up the sides of said sockets upon rotation of said other socket to the actuated position to thereby generate a force tending to separate said sockets whereby forces are generated acting through said force transmitting member to effect a mechanical brake actuation.

3,893,546

DISC BRAKE SUPPORT AND CALIPER MOUNTING

William J. Kestermeier, and Richard T. Burnett, both of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Filed May 20, 1974, Ser. No. 471,377
Int. Cl. F16d *65/02*
U.S. Cl. 188—73.3 **10 Claims**



1. In a brake, a rotor having a pair of friction faces, a pair of friction elements, one of said elements being disposed adjacent each of said friction faces, a support member mounted adjacent one of said friction faces, said support member having a pair of circumferentially spaced arms defining a recess therebetween, a member straddling said rotor and

engaging each of said friction elements for urging the latter into braking engagement with their corresponding friction faces when a brake application is effected, at least one of the friction elements being secured to the straddling member, means slidably mounting said straddling member on said support member for transverse relative movement with respect to said rotor, said slidably mounting means including a socket on the outer edge of one of said arms, and pin means connected to said straddling member and received in said socket whereby braking torque is transmitted from the straddling member to the support member through the pin means and said socket when braking during rotation of said rotor in one direction, the edge of said one arm facing into said recess having a bearing surface cooperating with a corresponding bearing surface on said straddling member whereby braking torque is transmitted from the straddling member to said torque member through said bearing surfaces upon braking during rotation of said rotor in the opposite direction, and means operatively connecting the other arm of the support member and the straddling member for inhibiting rotation of said straddling member about said pin means.

3,893,547

BRAKE SHOE SUSPENSION

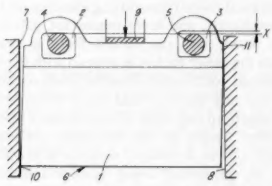
Johannes Hans Schanz, Mariannenweg, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Aug. 27, 1973, Ser. No. 391,927

Claims priority, application Germany, Sept. 30, 1972, 2248143

Int. Cl. F16d *65/02*

U.S. Cl. 188—73.5 **4 Claims**



1. A brake shoe suspension arrangement for disc brakes comprising:

a brake shoe shaft having a pair of spaced lateral guide surfaces;

a brake shoe having a pair of edges, each of said pair of edges being parallel to each other and adjacent an associated one of said lateral guide surfaces, said brake shoe being disposed in said brake shoe shaft between said lateral guide surfaces so that there is clearance between each of said pair of edges of said brake shoe and the associated one of said lateral guide surfaces;

a pair of spaced holding holes disposed through said brake shoe adjacent the top surface of said brake shoe shaft;

a pair of locking pins each extending through a different one of said holding holes with clearance to secure said brake shoe in said brake shaft; and

a spring disposed parallel to said locking pins and engaging said brake shoe on an edge thereof having a perpendicular relation to said pair of edges between said holding holes; said spring exerting a vertical force on said brake shoe to urge said brake shoe radially inwardly;

a clearance between the radial outer most surfaces of one of said holes and said pin being greater than a clearance between the radial outer most surfaces of the other of said holes and said pin;

said holding holes, said spring, and said locking pins cooperating with each other to tilt said brake shoe relative to said lateral guide surfaces so that one portion of each of said pair of edges of said brake shoe abuts the associated one of said lateral guide surfaces.

3,893,548

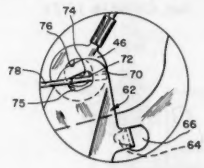
APPLICATION ADJUSTER FOR DRUM BRAKE

Daniel L. Bolenbaugh, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Mar. 11, 1974, Ser. No. 450,116

Int. Cl. F16d *51/52*

U.S. Cl. 188—79.5 GC **11 Claims**



1. In a drum brake, a backing plate for mounting on a non-rotative portion of a vehicle, a drum mounted for rotation with a member to be braked, a pair of brake shoes slidably mounted on said backing plate in end-to-end relationship, fluid motor means for urging said brake shoes into frictional engagement with said drum, resilient means yieldably urging said brake shoes away from said drum, an extendible adjusting strut between contiguous ends of said shoes, said adjusting strut including a starwheel for extending said strut upon rotation of the starwheel, an adjusting lever pivotally mounted on one of said shoes adjacent said starwheel for rotating the latter upon pivoting of the lever, wherein the invention comprises a spring extending between said adjusting lever and the other brake shoe, and a force transmitting member interconnecting the spring, the shoe, and the backing plate of the brake whereby upon movement of the shoe toward the drum in excess of a predetermined amount an actuating force is transmitted through said spring to pivot said lever as the brake is applied thereby effecting adjustment of the brake, and an overtravel connection between said spring and said lever to permit movement of the spring relative to the lever when the adjuster lever is prevented from moving.

3,893,549

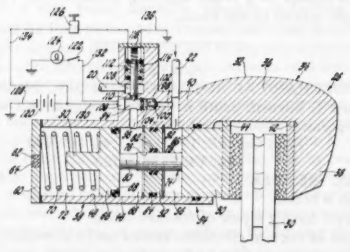
BRAKE APPLY AND RELEASE MECHANISM

Ronald W. Bennett, Miamisburg, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 25, 1974, Ser. No. 454,096

Int. Cl. F16d *65/24*

U.S. Cl. 188—170 **1 Claim**



1. A parking and service brake comprising:

a rotatable element to be braked and friction braking means for friction braking engagement therewith;

a brake actuating and release mechanism;

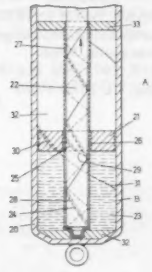
a selectively actuated master cylinder having a fluid pressurizing chamber and a fluid reservoir;
a first fluid conduit fluidly connecting said master cylinder fluid reservoir and said brake actuating and release mechanism;
a second fluid conduit fluidly connecting said master cylinder fluid pressurizing chamber and said brake actuating and release mechanism;
said brake actuating and release mechanism including
a housing having a cylinder bore therein,
a fixed wall dividing said cylinder bore into first and second fluid pressure chambers,
first and second pistons reciprocably received in said cylinder bore on opposite sides of said fixed wall and respectively defining movable end walls of said first and second chambers, said second piston operatively engaging said friction braking means to exert braking forces thereon as said second piston is urged in the brake applying direction away from said fixed wall,
an axially movable push rod sealingly extending through an aperture in said fixed wall and engageable by said pistons to transmit forces only in compression between said pistons,
a pre-loaded compression spring in said cylinder bore engaging said first piston and continually urging said first piston toward said push rod and said second piston, said spring exerting a brake apply force compressibly therethrough in one condition of operation,
and first and second fluid passages in said housing respectively connecting with said first and second chambers and having a check valve therebetween permitting fluid flow and pressure communication only from said second fluid passage to said first fluid passage,
said first passage having an outlet port fluidly connected with said first fluid conduit and a normally closed but selectively opened valve fluidly intermediate said outlet port and the connection of said first passage and said check valve,
said second passage having a port fluidly connected with said second fluid conduit to receive fluid delivered under pressure from said master cylinder pressurizing chamber and deliver the same to said second fluid pressure chamber at desired brake actuating pressure levels when said master cylinder is actuated;
said master cylinder also delivering fluid under pressure from said fluid pressurizing chamber to said second passage and through said check valve and said first passage to said first fluid pressure chamber to urge said first piston away from said fixed wall and compress said spring to store force therein, said check valve and said normally closed valve holding fluid pressure in said first fluid pressure chember and said first passage upon release of fluid pressure in said second fluid chamber and said second passage to keep force stored in said spring by compression thereof and to permit said second piston to move toward said fixed wall to release the brake;
and means controlled independently of actuation of said master cylinder to open said normally closed valve to communicate said first fluid pressure chamber and said first passage to said reservoir through said first fluid conduit to release the pressurized fluid in said first fluid pressure chamber and said passage, thereby releasing the force stored in said spring to move said first piston against said push rod and to move said push rod against said second piston to exert the force released from said spring to cause said friction braking means to engage said rotatable element in friction braking relation, said check valve acting when said normally closed valve is open and fluid pressure is being delivered to said second passage to permit fluid flow therethrough from said second passage into said first passage and thence through said open normally closed valve and said first fluid conduit to said fluid reservoir to return any fluid displaced through said second passage under these conditions to said fluid reservoir.

3,893,550

HYDRAULIC SHOCK ABSORBER OF THE TELESCOPIC TYPE

Victoriano San Pablo De La Rosa, Manuel Gonzales Longaria No. 2, Madrid 10, Spain

Filed Oct. 23, 1973, Ser. No. 408,587
Claims priority, application Spain, Oct. 20, 1972, 407795
Int. Cl. F16f *9/32*
U.S. Cl. 188—322 **7 Claims**



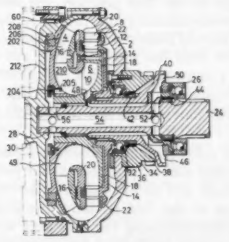
1. A hydraulic shock absorber comprising: a cylinder having a first helicoidal surface on the interior thereof; a piston rod movable within said cylinder; a piston, said piston having at least one helicoidal surface adapted to coact with said helicoidal surface of said cylinder and having an axially disposed bore through which said piston rod extends, and at least one interengaging helical formation interposed between said piston rod and piston such that movement of the piston rod causes the piston to move along the piston rod, axial displacement of the piston exerting a pressure on fluid in said cylinder.

3,893,551

TORQUE CONVERTER TRANSMISSION HAVING ROTATING CASING, AND RELEASABLE PUMP

Karl Gustav Ahlen, Stockholm, Sweden, assignor to S.R.M. Hydromekanik AB, Sweden

Filed June 14, 1972, Ser. No. 262,514
Claims priority, application United Kingdom, June 25, 1971, 29886/71; Sept. 9, 1971, 42130/71
Int. Cl. F16d *33/10;* **F16h** *47/00*
U.S. Cl. 192—3.33 **45 Claims**



1. A torque converter of the type having a rotating casing adapted to be connected to a drive source and forming therein a working chamber having therein a pump part including at least one ring of pump blades, a reaction part including at least one ring of guide blades and a turbine part including at least one ring of turbine blades, at least one of said pump part and said casing being a movable member movable axially towards and away from the other, such that the pump part and the casing are relatively movable axially between at least a first position in which the pump part is connected to the said casing

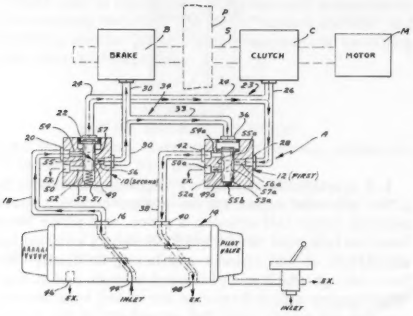
for rotation therewith and a second position in which the pump part is released from the casing to rotate in relation thereto, a servo-motor means for moving the movable member between said first and second positions, the pump part being the piston of said servo-motor, such that a fluid pressure differential on opposite sides of said pump part effects movement of said movable member between said first and second positions.

3,893,552

CLUTCH AND BRAKE WITH INTERLOCK VALVES

Eugene L. Dahl, Minneapolis, Minn., assignor to Horton Manufacturing Co., Minneapolis, Minn.

Filed Oct. 5, 1973, Ser. No. 403,803
Int. Cl. F16d *67/04*
U.S. Cl. 192—12 C **1 Claim**



1. A fluid control system for controlling the operation of a mechanism, comprising in combination:

a. a mobile part;

b. a motor driving the mobile part;

c. a fluid sensitive, operated brake operatively interconnected to the mobile part having a fluid pressure sensor port;

d. a fluid sensitive, operated clutch operatively interconnected to the mobile part having a fluid pressure sensor port;

e. a first delay member including a piston having a first position and second position, a first port, a second port, a third port, and an exhaust port, and means for biasing the piston to the first position, the first position of the piston communicating the first port with the third port and the second position of the piston communicating the third port with the exhaust port, and the second port directly communicating with the piston such that when fluid is supplied under pressure to the second port, the piston will move from the first position to the second position;

f. a second delay member including a piston having a first position and second position, a first port, a second port, a third port, and an exhaust port, and means for biasing the piston to the first position, the first position of the piston communicating the first port with the third port and the second position of the piston communicating the third port with the exhaust port, and the second port directly communicating with the piston such that when fluid is supplied under pressure to the second port, the piston will move from the first position to the second position;

g. a fluid line connecting the third port of the first delay member to the fluid pressure sensor port of the clutch and to the second port of the second delay member;

h. a fluid line connecting the third port of the second delay member to the fluid pressure sensor port of the brake and to the second port of the first delay member;

i. a spool valve having a first position and a second position including a first port, second port, a third port, a fourth port, and a fifth port, the first position communicating the fourth port with the first port and communicating the second port with the fifth port, and the second position communicating the first port with the third port and communicating the fourth port with the second port;

j. a fluid line connecting the first port of the spool valve with the first port of the second delay member;

k. a fluid line connecting the second port of the spool valve with the first port of the first delay member;

l. means for supplying pressurized fluid to the fourth port of the spool valve; and

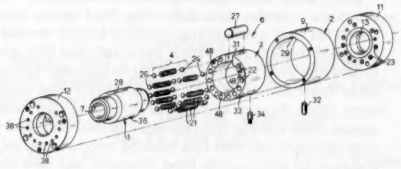
m. means for allowing the exhausting of fluid from the third port and the fifth port of the spool valve, the exhaust port of the first delay member, and the exhaust port of the second delay member whereby when the spool valve is in the first position, fluid under pressure is supplied through the second delay member to the fluid pressure sensor port of the brake and to the second port of the first delay member and simultaneously the second port of the second delay member and the fluid sensor port of the clutch communicate through the first delay member to the exhaust means and when the spool valve is in the second position, fluid under pressure is supplied through the first delay member to the fluid pressure sensor port of the clutch and to the second port of the second delay member and simultaneously the second port of the first delay member and the fluid pressure sensor port of the brake communicate through the second delay member to the exhaust means thus preventing overlap in clutch-brake cycles where there is a fast cycle from clutch to brake or brake to clutch.

3,893,553

OVERLOAD RELEASE CLUTCH

Quinten A. Hansen, Highway 38, Franksville, Wis. 53126

Filed May 13, 1974, Ser. No. 469,308
Int. Cl. F16d *7/02*
U.S. Cl. 192—56 R **9 Claims**



1. An overload release clutch comprising radially inner and outer clutch members defining an annular space therebetween, a rotor within said space; detent means operatively interposed between said rotor and one of said clutch members; and double throw lock-up means operatively associated with said inner and outer clutch members and with said rotor whereby said rotor may be coupled selectively with either said inner or with said outer clutch member.

3,893,554

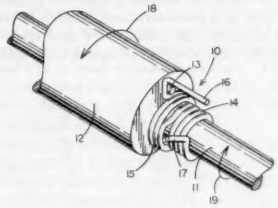
TORQUE LIMITING CLUTCH

Thomas D. Wason, 313 W. Park Dr., Raleigh, N.C. 27605

Filed June 7, 1974, Ser. No. 477,446
Int. Cl.[2] F16D *43/21, 41/20*
U.S. Cl. 192—56 C **8 Claims**

1. A torque limiting device comprising: a first shaft; a second shaft juxtaposed to and in general axial alignment with

said first shaft; a clutch means including a coil portion encircling said first shaft in gripping contact therewith; a second coil portion continuous with said first portion and encircling said first shaft, said second portion having an interior diameter greater than the diameter of the said encircled shaft; means extending from said second coil into drive contact with said second shaft; means extending from said first coil in normally spaced relation to said means extending from said second coil



in such a position that, under torsion, said arms travel in a path so that they operatively contact each other when under predetermined torque whereby said second extending means, under predetermined load, will move against and exert pressure on said first extending means thereby at least partially unwinding the same to at least partially release the gripping pressure of said first coil on said first shaft thereby allowing rotational slippage between said first and second shafts.

3,893,555

ROTARY FANS

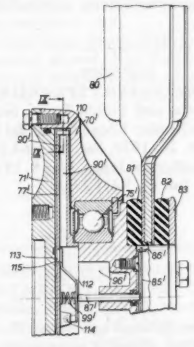
Arthur Ernest Henry Elmer, Painswick, England, assignor to Dynair Limited, Gloucestershire, England

Filed Mar. 8, 1974, Ser. No. 449,375

Claims priority, application United Kingdom, May 24, 1973, 24931/73

Int. Cl. F01p *7/02*

U.S. Cl. 192—58 B **8 Claims**



1. A rotary cooling fan including a variable speed torsion drive, comprising an annular casing provided with means for connection to an input drive shaft at one end, an output shaft extending through a central aperture at the other end of said casing and having a plurality of fan blades secured thereto, an inner rotary body located within said casing and secured to said output shaft, said rotary body and said casing being formed with cooperating closely spaced surfaces defining a clearance space, means for retaining a quantity of a viscous liquid in the space between said surfaces, a liquid reservoir formed within said rotary body or in said output shaft, scoop means mounted on said inner body for impelling liquid from said clearance space to said reservoir as a result of relative rotation between said rotary body and casing, valve means controlling the return flow of liquid from said reservoir to said clearance space, a temperature responsive element located externally of said casing, and actuating means for operating said valve in response to sensed changes of temperature by said element.

3,893,556

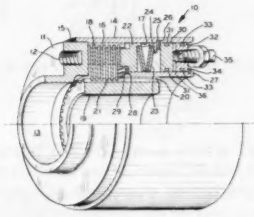
FLUID RELEASED CLUTCH

Ted Lech, Jr., Roseville, Mich., and Christian M. Waldhelm, San Diego, Calif., assignors to Dana Corporation, Toledo, Ohio

Filed May 2, 1974, Ser. No. 466,094

Int. Cl.² F16D *25/00*

U.S. Cl. 192—91 A **1 Claim**



1. A normally engaged torque transmitting device for connecting an input and output comprising:

a. a tubular housing adapted for connection to said output including a bore, a first axially extending spline within said bore and an annular groove defined in said bore;

b. a first snap ring carried in said groove;

c. a friction disc carried within said bore and axially piloted on said first spline;

d. an input member adapted for connection to said input and including a second axially extending spline thereon;

e. a separator plate adjacent said friction disc, carried on said input member and axially piloted on said second spline;

f. an annular pressure plate slidably received within said bore and adjacent said friction disc and separator plate;

g. release means carried within said bore to selectively urge said pressure plate away from said friction disc and separator plate, said release means comprising:

i. an annular reaction plate slidably and sealingly carried within said bore and secured against axial movement therealong in the direction of said annular pressure plate by said first snap ring;

ii. a tubular axially shiftable member defining an annular groove on the exterior of each end thereof, a second and third snap ring carried in respective ones of said grooves therein, said second snap ring engaging said annular pressure plate, said tubular member slidably and sealingly engaging the interior of said annular reaction plate;

iii. a third annular plate, located within and slidably and sealingly engaging said bore and engaging the exterior said axially shiftable tubular member and said third snap ring;

iv. said third annular plate being adjacent and spaced from said annular reaction plate and forming a cavity therebetween; and

v. means for introducing fluid within said cavity whereby said third annular plate moves away from said reaction plate and thereby moves said pressure plate away from said discs; and

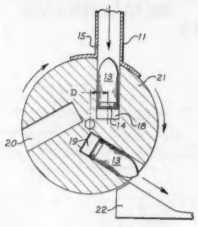
h. belville spring means between said pressure plate and said reaction plate, said spring means reacting against said pressure plate and said first snap ring to normally bias

said pressure plate toward said friction disc and separator plate.

3,893,557
PNEUMATIC STRIKEDOWN SYSTEM FOR PROJECTILES

J. Luis Frenk, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 29, 1974, Ser. No. 456,082
Int. Cl.[2] B65G *11/20*
U.S. Cl. 193—32 **1 Claim**



1. A handling device for a projectile having a temporarily mounted resilient boot on one end comprising,

a vertically oriented tube having an inner diameter slightly larger than the diameter of said projectile and slightly smaller than the diameter of said resilient boot whereby said resilient boot provides an air seal when said projectile is falling through said tube,

at least one orifice in the side of said tube near a lower end for allowing air to escape during descent of said projectile through said tube thereby regulating the speed of descent of said projectile,

a drum rotatably positioned at the lower end of said tube providing a closure for the lower end of said tube, said drum being rotatable about a horizontally oriented shaft offset a first fixed distance from the central axis of said vertically oriented tube, and

at least three cavities in said drum each having its central axis offset a fixed distance equal to said first fixed distance whereby said central axis of each said cavity is alignable with the central axis of said vertically oriented tube and whereby loading of a projectile through said vertically oriented tube into one of said cavities causes rotation of said drum.

3,893,558
SPECIAL SYMBOL GENERATOR FOR HIGH SPEED PRINTER

John R. Fulton, Brookfield, and George W. Volling, Round Lake Beach, both of Ill., assignors to Extel Corporation, Northbrook, Ill.

Filed May 17, 1974, Ser. No. 470,846
Int. Cl. B41j *3/04*
U.S. Cl. 197—1 R **8 Claims**

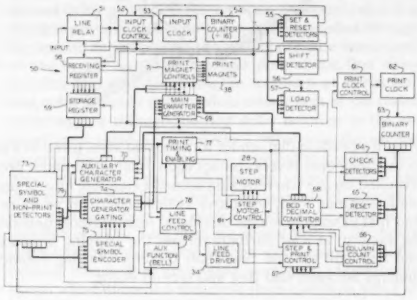
1. In a high-speed dot matrix printer of the kind comprising a plurality of individual signal-actuated dot printer elements that print standard data characters in a basic format constituting a group of dot-position columns each including a given number of dot positions, with each such group of columns normally separated from the next adjacent group by a predetermined number of blank columns, a control system enabling the printer to print special symbols unsuited to the basic format, utilizing an input signal comprising a series of intermixed code words individually respresentative of standard data characters and special symbols, said control system comprising:

a plural-level data store for receiving said input signal and capable of storing a plurality of received code words, each received code word being initially recorded in an input level of said store and then advanced to an output level;

a main character signal generator, coupled to said dot printer elements, for actuating said dot printer elements to print characters in said basic format;

encoding means for generating a series of modified code words each representative of a part of a special symbol, which part is reproducible in said basic format;

an auxiliary character signal generator, coupled to said dot printer elements, for actuating said dot printer elements to print dots in a predetermined pattern in one or more columns adjacent the columns of said basic format to complete the reproduction of said special symbols;



gating means, coupling an output level of said data store and said encoding means to said main character signal generator;

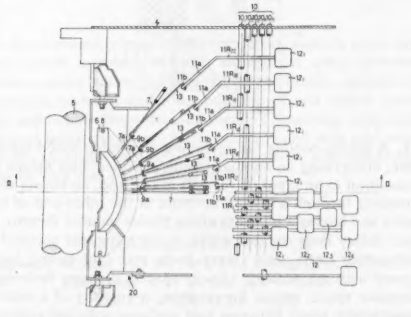
and special symbol detector means, coupled to said data store, said gating means, and said encoding means, for identifying received code words representative of said special symbols, and for actuating said gating means and said encoding means to apply modified code words to said main character generator;

said encoding means also being coupled to said auxiliary character generator to actuate said auxiliary character signal generator.

3,893,559
HAND-OPERATED TYPEWRITER

Yukio Hishida, Nagoya, and Yoshio Tsuru, Iwakura, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Apr. 26, 1974, Ser. No. 464,481
Claims priority, application Japan, May 8, 1973, 48-51482
Int. Cl. B41j *23/08*
U.S. Cl. 197—17 **6 Claims**



1. In a hand-operated typewriter wherein characters are typed by applying fingers to keys (12) disposed in rows, the

keys being located at the center part and the outer parts of each row, said typewriter having:

a. a frame (4) extending from the front near to the operator to the rear far from the operator;

b. a type bar supporting segment (6) shiftably mounted on said frame, for movement to a high and a low position with a semicircular pivot wire (8) held therein;

c. a plurality of type bars (7) having at least two type characters at the upper end which can be selectively applied to paper and a boot shaped part at the lower end for pivotal lever action pivotally supported on said segment (6) by said wire (8);

d. key levers (11) and connecting means (13), there being one key lever (11) connected to the lower end of each type bar (7) by said connecting means (13) so adapted and disposed that the pivoting action of the key lever (11) and said connecting means on said lower end causes type bar to pivot about said wire;

e. shift means (20) connected to said segment (6) to move said segment (6) to the high and low positions to select one of the characters thereon for typing; wherein the improvement comprises

f. several key lever shafts mounted on said frame in several rows at different heights and different distances from the front side of said frame for pivotally supporting said key levers;

g. said type bars having connecting apertures for said connecting means in the boot shaped part there being at least two kinds of apertures at a relatively near and relatively far distance from said pivot wire;

h. said key levers corresponding to each row of the keys being supported by using of at least two adjacent shafts of said key lever shafts, the lowest one of said at least two adjacent shafts supporting said key levers corresponding to the keys positioned at the center part of each row of the keys and some of those said key levers which correspond to the keys positioned at the outer parts of each row, and said other shaft or shafts except said lowest shaft supporting other of the keys positioned at the outer parts of each row;

i. said connecting means corresponding to said key levers of the keys in a center part of each row being connected with said connecting aperture having a rather short distance from said pivot wire;

j. and said connecting means corresponding to said key levers supported on said other shaft or shafts being selectively connected with said other of said apertures,

so that the strokes of all keys are equalized.

3,893,560

WORD PROCESSOR HAVING SELECTIVELY PRINTED DATA BLOCK ADDRESS CODES

Richard E. Heitman, Acton; Peter G. Martin, Arlington; Richard C. Norris, Belmont, and Genio R. Arciprete, Lexington, all of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed May 18, 1972, Ser. No. 254,744
Int. Cl. B41j *5/30*
U.S. Cl. 197—19 **18 Claims**

1. A data writing system comprising;

storage means for storing data in a plurality of storage blocks, each storage block having the same fixed maximum capacity for storage of said data, each of said storage blocks having associated therewith a unique stored address code;

means for converting data stored in said storage means to corresponding indicia written in a sequence of separate lines; and

means for selectively converting the particular stored address code associated with the data corresponding to the

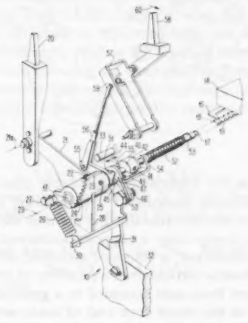
indicia in any of said lines, to written form on said any line.

3,893,561

HALF BACKSPACE FOR DUAL PITCH TYPEWRITER

John Gilbert Gibbons, and Raymond Michael Marowski, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 23, 1973, Ser. No. 418,349
Int. Cl.[2] B41J *19/62*
U.S. Cl. 197—91 **1 Claim**



1. A typewriter having printing and paper support means defining therebetween a printing point movable along a writing line, frame means, letter feeding mechanism comprising an escapement rack, means supporting said escapement rack on said frame means for movement along an axis that is parallel to said writing line, wherein the improvement comprises:

first and second opposed camming members,

connecting means connecting said first camming member to said escapement rack for unitary movement therewith in a first direction that is parallel to said writing line,

means connected with said frame means for supporting said second camming member against movement in said first direction,

one of said camming members being supported for movement relative to the other said camming member in a second direction that is transverse to said first direction, said first and second camming members each providing a plurality of camming surface portions that are symmetrically spaced about said axis of rack movement and are mutually configured such that relative movement therebetween in said second direction produces relative movement of said first camming member in said first direction,

a control arm connected to said one of said camming

members for moving said one of said camming members in said second direction,

stop means mounted on said escapement rack, and

abutment means supportedly connected to said frame means in cooperatively spaced relationship with respect to said stop means whereby the motion of said escapement rack along said axis of rack movement is limited by engagement of said stop means with said abutment means,

said escapement rack comprises a cylindrical rod,

said first camming member is rotatably carried by said cylindrical rod for rotational movement in said second direction and said second camming member is stationarily secured with respect to said frame means.

3,893,562

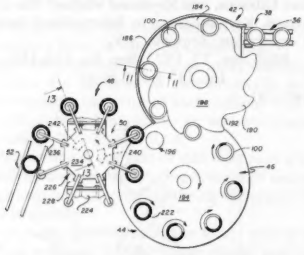
ROTATABLE APPARATUS FOR TRANSFERRING ARTICLES

Robert L. Hurst, Muncie, Ind., assignor to Ball Corporation, Muncie, Ind.

Division of Ser. No. 99,405, Dec. 18, 1970, Pat. No. 3,712,453, which is a division of Ser. No. 784,845, Dec. 18, 1968, Pat. No. 3,641,959. This application Dec. 20, 1972, Ser. No. 316,956

Int. Cl. B65g *47/06*

U.S. Cl. 198—25 **2 Claims**



1. Apparatus for sequentially removing plate-like articles from the processing stations of a processing table rotating about a vertical axis and transferring them to the adjacent end of a conveyor, comprising: a support positioned between the table and the conveyor; a standard mounted on said support for rotation about a vertical axis; a plurality of arms extending radially outward from said standard in a generally horizontal plane; means at the outer free end of each arm adapted to engage and lift and article vertically from an underlying processing station, said means comprising a magnet to attract an article as the magnet overlies a processing station and to support the article during arcuate travel to the adjacent end of the conveyor and means to create a magnetic field to remove said article from said magnet for deposit on the conveyor; each arm being of such length that its article engaging means will directly overlie a processing station at one point in its rotation and will overlie the adjacent end of the conveyor at another point in its rotation; and means to cause continuous sequential transfer of articles from the processing table to the conveyor.

3,893,563

TOBACCO LEAF HANDLING AND DISTRIBUTING APPARATUS

Charles D. Hansen, Jr., Richmond, Va., assignor to AMF Incorporated, White Plains, N.Y.

Filed Nov. 29, 1973, Ser. No. 420,112

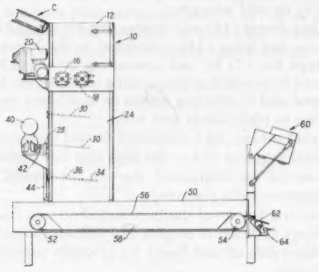
Int. Cl. B65g *47/18, 47/44*

U.S. Cl. 198—45 **8 Claims**

1. Apparatus for delivering distributed articles, comprising: a conveyor for delivering articles along a predetermined path, first means for positively metering at a predetermined rate articles to be delivered.

a hopper for receiving a supply of articles to be delivered and a pair of laterally spaced apart rotatable members forming the bottom of said hopper providing said first means;

said rotatable members being rotated in directions each opposite to the other on substantially parallel axes disposed transverse to the path along which the articles are delivered, and



second means being disposed substantially horizontally for receiving metered articles and oscillating for distributing such articles in a lateral direction relative to the predetermined path along which said articles are delivered,

said second means showering such articles on to said conveyor so that the relative movement of said conveyor distributes the showered articles on said conveyor in a longitudinal direction relative to the predetermined path along which such articles are delivered.

3,893,564

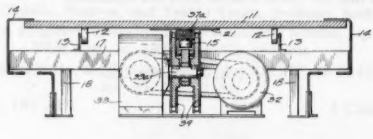
ARTICLE CARRIER AND DRIVE MEANS THEREFOR

Warren S. Raynor, Port Hope, and Jacob Hermans, Cobourg, both of Canada, assignors to Rexnord Incorporated, Milwaukee, Wis.

Continuation of Ser. No. 308,891, Nov. 22, 1972, abandoned. This application Mar. 7, 1974, Ser. No. 449,169

Int. Cl. B65g *17/00*

U.S. Cl. 198—189 **7 Claims**



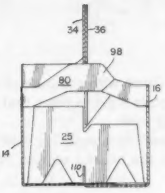
1. A horizontal conveyor comprising an endless series of roller-supported pallets having interconnecting links and a drive system therefor, each link comprising a plate attached to the underside of a pallet, a rod and first and second members which are pivotally interconnected for relative rotation on a vertical axis, the first member being attached to the plate extending downwardly therefrom and the second member being joined to one end of said rod, the other end of said rod being attached to the underside of said plate whereby said links and pallets are interconnected to form a closed loop, said drive system comprising a driven member attached to the underside of each plate and disposed intermediate said links, a series of drive members adapted to engage successive driven members, a pair of drive chains, said series of drive members being disposed between and carried by said chains, and a spaced pair of drive sprockets over which said chains operate; said chains and sprockets being disposed and spaced laterally to allow the driven members and links to pass between said

chains and sprockets, the adjacent links and the intermediate driven members being spaced in the loop direction to allow a drive member to engage the driven member in the horizontal plane immediately below said plate whereby the movement of the chains drives the links and pallets in said closed loop.

3,893,565
BOTTLE CARRIER

Harry J. Rossi, deceased, late of Parsipanny, N.J. (by Evelyn A. Rossi, executrix), and Edwin L. Arneson, Hillsdale, N.J., assignors to Federal Paper Board Company, Inc., Montvale, N.J.

Filed Oct. 16, 1972, Ser. No. 297,742
Int. Cl. B65d *75/00*
U.S. Cl. 206—183 **7 Claims**



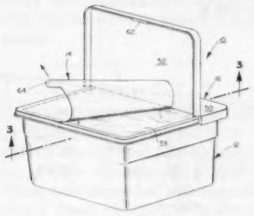
1. A multi-cellular carrier for bottled products which is formed from an elongate blank of foldable sheet material cut and scored to provide a plurality of connected wall and partition forming panels, said carrier comprising, in set up position, hingedly connected, body forming upstanding side and end walls and a bottom wall, which bottom wall comprises two panel members each having an integrally hinged connection with said side walls at the bottom edges of said side walls and having overlapping marginal portions which are opposite said hinged connection with the side walls and which have means securing said marginal portions in interlocked relation, a multi-ply longitudinal partition and handle structure, formed of a plurality of panel members in face engaging relation, which partition and handle structure is connected at its opposite ends to the end walls on vertical hinge lines, and longitudinally spaced cross partition panels in the form of strap members dividing the space on opposite sides of the longitudinal partition and handle structure into a plurality of bottle accommodating cells of equal size, said cross partition forming strap members each having one end integrally connected on a vertical hinge line to a top marginal portion of a side wall and said cross partition forming strap members each having an opposite end portion extending to a hinge connection with said longitudinal partition and handle structure so as to swing relative thereto on a vertical hinge line, and at least one of said cross partition strap members having said opposite end portion thereof extending beyond the plane of said longitudinal partition and handle structure and secured to a corresponding cross partition strap member on the opposite side of said longitudinal partition and handle structure so as to reinforce the hinge connection of said cross partition strap member with said longitudinal partition and handle structure.

3,893,566
PACKAGING SYSTEM INCLUDING REMOVABLE MOISTURE-IMPERVIOUS SEALING SHEET

Richard T. Ross, Aston, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Oct. 17, 1973, Ser. No. 407,146
Int. Cl. B65d *5/54*
U.S. Cl. 206—498 **3 Claims**

1. A packaging system comprising:
   a. a container body including a bottom wall, peripheral walls extending upwardly from said bottom wall and having upper margins which define an opening into an inner compartment of said body;
   b. a unitary closure attached to said body, said closure including a top wall overlying the open end of the compartment, said top wall including a thinned transverse section intermediate forward and rearward ends thereof for forming a transversely extending hinge and tearing edge, said hinge dividing said closure into a forward movable door portion and rearward stationary cover portion; and
   c. a moisture-impervious sheet secured to said container body and being disposed between the container body and

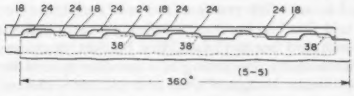


unitary closure, said sheet overlying the open end of the inner compartment and including a weakened region intermediate forward and rearward ends thereof for dividing said sheet into a forward section underlying the movable door portion of the closure and a rearward section underlying the stationary cover portion of said closure, said weakened region of the sheet being adjacent the tearing edge of the closure whereby the forward section of the sheet is separated from the rearward section of the sheet by peeling the forward section off of the container body toward the weakened region, whereat the forward section follows the tearing edge of the closure and is thereby separated from the rearward section.

3,893,567
VERTICAL STACKER

Paul Davis, Swampscott, and David N. Shore, Brookline, both of Mass., assignors to Sweetheart Plastics, Inc., Wilmington, Mass.

Filed Aug. 16, 1972, Ser. No. 280,962
Int. Cl. B65d *21/02*
U.S. Cl. 206—520 **8 Claims**

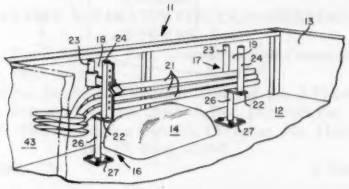


1. A one-piece, thin wall, disposable, plastic article comprising
   an outwardly inclined axially extending wall and a transverse wall integral with the axially extending wall,
   and a nesting facility formed in the axially extending wall, said nesting facility having
   a lower external shoulder and an upper internal shoulder,
   a substantially vertical disposed intermediate wall section interconnecting the inner radial edge of one shoulder and the outer radial edge of the other,
   a plurality of substantially vertically disposed protrusions formed in the intermediate wall extending the full axial height thereof, said protrusions being spaced apart about the intermediate wall a distance substantially equal to the circumferential width of the protrusions so that each protrusion has a circumferential width equal to the circumferential width of each intermediate wall portion

between each protrusion, with said protrusions acting to provide a stacking interference at equally spaced portions about the circumference of the article when it is stacked with a similar article out of circumferential phase therewith,

said intermediate wall section being free of undercuts between the upper and lower shoulders.

3,893,568
TOOL HOLDER
William H. Lile, 771-6 N. Fair Oaks, Sunnyvale, Calif. 94086
Filed Oct. 11, 1973, Ser. No. 405,394
Int. Cl.[2] A47F *7/00;* **B60R** *9/00;* **A47B** *81/00*
U.S. Cl. 211—49 R **3 Claims**

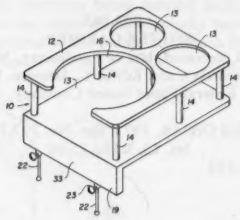


1. A holder for preventing theft of elongated tools or other implements, each of which has a portion along its length wider than another portion thereof, comprising first bracket means defining a slot having an open end opposite the bottom wall and within which a plurality of implements are stackable between opposed slot sidewalls with such sidewalls on opposite sides of said implements, the width of said slot between said sidewalls being less than the width of said wider portion of each of said implements intended to be held thereby, whereby transverse movement of said implement wider portions through said slot is prevented; means for securely mounting said first bracket means on a surface; a closure associated with said first bracket means selectively moveable between a first position free of said slot and a second position extending across said slot to block removal of implements through the open end of said slot, one of said slot sidewalls having a plurality of apertures extending in a column depthwise of said slot, said closure cooperable with any selected one of said apertures to provide adjustment depthwise of said slot of the location at which said closure is extendable across said slot, said closure further including means for locking the same in said second position and preventing unauthorized movement thereof to said first position; second bracket means spaced from said first bracket means defining a second slot in alignment with said first slot of said first bracket means to cooperate therewith by positioning at a location spaced from said bracket means elongated tools or implements stacked within said first slot, said lockable closure being pivotally secured to said second bracket means for pivotal movement between said first and second positions, and said means for locking said closure in said second position including an aperture at the free end of said closure which is registerable with any selected one of said plurality of apertures on said first bracket means for passage therethrough of a lock for securing said closure free end to said bracket at a selected location of said closure.

3,893,569
THERMOS SUPPORT TRAY
Frank R. Hoch, 200 Garcia, Trinidad, Colo. 81082
Filed Mar. 21, 1974, Ser. No. 453,268
Int. Cl.[2] A47B *85/00*
U.S. Cl. 211—74 **1 Claim**

1. A support structure adaptable for mounting about the floor hump of an automobile and shaped to support one or more thermos jugs comprising

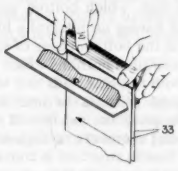
a base plate mounted by posts to a parallel shelf plate, said base plate fitted along the underside of a first edge with a pair of telescopic legs of adjustable length, said base plate fitted on the underside of a second edge with a stop bracket,



said shelf plate fitted with cut-outs of a circular shape of a size to each retain a jug in place that is resting on the base plate, together with

a threaded adjustable length leg which is threadably fastened through the central section of the base plate.

3,893,570
TROUSER HANGER
Kuno J. Vogt, 5854 Kantor Ct., San Diego, Calif. 92122
Filed Oct. 23, 1973, Ser. No. 408,462
Int. Cl. A47g *25/04;* **A47j** *51/14*
U.S. Cl. 211—89 **2 Claims**



1. A trouser hanger comprising:

a bracket;

said bracket having a vertical section and a horizontal section, the vertical section being adapted for mounting to a vertical surface;

a slot in said horizontal section dimensioned for receiving at least one pair of trouser legs;

a clamp plate coupled to said horizontal section in proximity with said slot and dimensioned for clamping a pair of trouser legs slidably received by said slot and holding said trouser legs through gravitational force;

said clamp plate being angled in an upward direction from each side of a center portion thereof; and

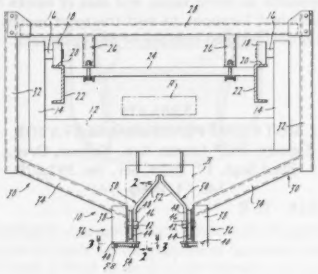
said plate being coupled adjacent said center portion by means for loosely and pivotally coupling said clamp plate for limited oscillatory movement about at least a vertical axis and a horizontal axis which axes generally intersect.

3,893,571
CABLE FLEX LIMITING DEVICE
Roger Metailler, Grenoble, France, assignor to Ford Motor Company, Dearborn, Mich.
Filed May 28, 1974, Ser. No. 473,862
Int. Cl. B66c *19/00, 21/00*
U.S. Cl. 212—117 **3 Claims**

1. In a boom having a movable crane crab mounted for movement thereon with cables, the improvement comprising a device for limiting the flexing of said cables comprising:

a generally C-shaped frame with a horizontal back portion and two generally vertically depending branches, means mounting said back portion transversely on said boom so that a portion of said branches extend below said boom to define a space of sufficient size for said crane crab to move therethrough;

a pulley mounting structure attached to at least one end of one of said branches, a horizontal shaft rotatably mounted on said pulley mounting structure, a pulley rotatably mounted on said shaft;



an arm mounted on said shaft, said arm having a lower vertical portion and an upper bent portion, means operatively connecting said arm to said shaft so that said arm is rotatable therewith, said upper bent portion of said arm being located above said pulley and extending in a direction transversely of said boom so as to guide a flexing cable over said pulley and means for retractably connecting said arm to said pulley mounting structure to maintain said arm in a normal vertical position.

3,893,572

SYSTEMS FOR OPERATING AND CONTROLLING HYDRAULICALLY DRIVEN WINCHES, HOISTS, WINDLASSES AND THE LIKE

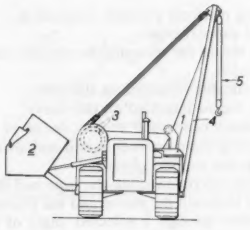
Evald Gustav Axelsson, Stafford, and David Collier, Brewood, both of England, assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 84,978, Oct. 29, 1970. This application July 16, 1973, Ser. No. 379,759

Claims priority, application United Kingdom, June 26, 1970, 31078/70

Int. Cl. B66c *23/72*

U.S. Cl. 212—49 **2 Claims**



1. In a crane system for operating and controlling a winding gear driven by a hydraulic motor of the kind including a stationary cylinder having a plurality of radial bores, a piston displaceable in each of the bores and each having an associated driving means, a cam ring having cam faces engaged by the driving means, and means for selectively supplying hydraulic fluid to the bores to displace the pistons radially in a predetermined sequence and by pressure engagement of the driving means with the cam faces to rotate the cam ring, the system including operator controlled pump means for supplying hydraulic fluid to the hydraulic motor, the improvement of free-run means for applying to the pistons of the hydraulic motor a hydraulic pressure differential to displace the pistons radially inwards and withdraw the associated driving means from contact with the cam faces of the cam ring whereby the cam ring can rotate freely, the hydraulic pressure for said free-run means being derived from a source separate from the pump means supplying said motor, a hoist including said free-run means, movable counterweight means for balancing the load on the hoist, hydraulic means, including second pump means, for moving the counterweight means, wherein the hydraulic pressure for the free-run means is supplied by the second pump means.

3,893,573

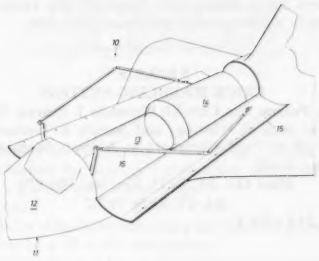
VARIABLE RATIO MIXED-MODE BILATERAL MASTER-SLAVE CONTROL SYSTEM FOR SHUTTLE REMOTE MANIPULATOR SYSTEM

James C. Fletcher, Deputy Administrator of the National Aeronautics and Space Administration, with respect to an invention of Fredrick J. Greeb; Shepard B. Brodie, both of Denver, Colo., and Carl R. Flatau, Shoreham, N.Y.

Filed Aug. 20, 1973, Ser. No. 389,916

Int. Cl. B25j *3/00*

U.S. Cl. 214—1 CM **18 Claims**



1. A remote manipulator system comprising

an articulated slave arm adapted to be fixedly attached for extension;

a master arm adapted to be manipulated by a user in a manner to impart movement to said slave arm; said slave arm and said master arm each being made up of a plurality of pivotally connected, constant length segments, the length of the segments of the slave arm to those of the master arm being a fixed ratio;

a control system connected between said master and said slave arms, said control system imparting movement to said slave arm at least partly in accordance with manipulation of said master arm, said control system at least enabling said slave arm to exercise two degrees of freedom, said control system including a controller receiving signals resulting from master arm manipulation and converting said signals from the master arm into signals for manipulation of the slave arm, means for providing different ratio of movement between said master arm and slave arms, and, means for selecting between different ratios, whereby in a coarse mode of operation, movement of the slave arm to the master arm is at a ratio of the length of slave arm to the master arm and in fine mode movement of the slave arm to the master arm is by a ratio of one-to-one.

3,893,574
GRIPPER DEVICES FOR LAYERS OF BRICK MOULDINGS

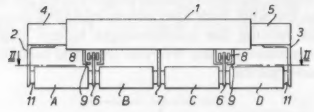
Hermann Kamphues, Prinzhugel 19b, 5433 Laggenbeck, Germany

Filed Nov. 6, 1973, Ser. No. 413,376

Claims priority, application Germany, Nov. 7, 1972, 2254432

Int. Cl. B66c *1/32*

U.S. Cl. 214—6 A **4 Claims**



1. In a gripper device for locating layers of brick mouldings in stacks in inclined cross combination, each said layer consisting of an even number of parallel rows of bricks,

outer jaws arranged to grip the outer longitudinal edges of the layers and, said outer jaws extending longitudinally of the rows and being fixed against longitudinal displacement relative to the rows, and

first and second intermediate jaw means located between the outer jaws and arranged to engage between the longitudinal edges of the rows, said first and second intermediate jaw means extending longitudinally of the rows, the first intermediate jaw means being located between pairs of rows and being fixed against longitudinal displacement relative to the rows, and the second intermediate jaw means being displaceable longitudinally relative to the rows in a substantially rectilinear direction.

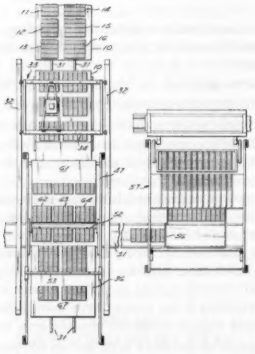
3,893,575
BRICK HANDLING SYSTEM

Frank S. Pearne, San Gabriel; Florentin J. Pearne; William P. Osborn, both of Whittier, and Joseph A. Guzzetta, Costa Mesa, all of Calif., assignors to Aircraft Mechanics, Inc., Downey, Calif.

Filed Oct. 15, 1973, Ser. No. 406,579

Int. Cl. B65g *59/02*

U.S. Cl. 214—8.5 C **16 Claims**



1. A handling system for unloading elongated kiln cars or the like when said cars are loaded with a plurality of stacks of bricks in grids stacked on each other and having rows of bricks therein extending normal to the rows of bricks in the adjacent grids in each stack and wherein the number of stacks along the length of the car differs from the number of stacks across the width of the car comprising support means, a gripper transfer operable in a first orientation to simultaneously grip groups of aligned rows of bricks along the entire length of said kiln car and to position said bricks in ranks and files at a first location on said support means, said gripper transfer being operable in a second orientation to simultaneously grip groups of aligned rows of bricks across the entire width of said car and to position said bricks in ranks and files on said support means at a second location, transport means operable to receive rank files of bricks from both said first and second locations and to transport such bricks to a delivery position, and transfer means operable to move ranks and files of bricks from said first and second locations to said transport means in ranks having a predetermined number of bricks therein.

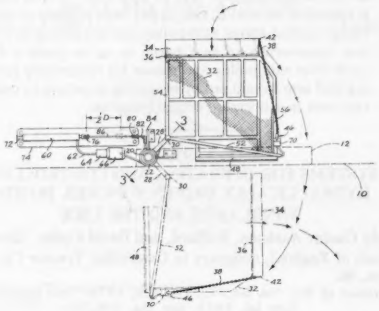
3,893,576
ROTATING PLATFORM ELEVATOR

Chris D. Casady, 1627 Linnea Ave., Eugene, Oreg.

Filed Sept. 17, 1973, Ser. No. 397,679

Int. Cl. B60p *1/44*

U.S. Cl. 214—75 R **1 Claim**



1. A rotating platform elevator comprising:

a. a vertical support pipe,

b. securing means for securing the support pipe to a structural member,

c. a sleeve slidably mounted on the pipe,

d. platform means mounted on the sleeve,

e. drive means connected to the sleeve or platform for reciprocating them between raised and lowered positions relative to the support pipe, and

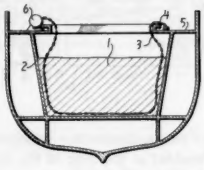
f. cam means interconnecting the pipe and the sleeve and operative to rotate the sleeve and the platform in a horizontal plane through a selected angle of rotation at a predetermined elevation of the platform, the cam means comprising a vertical slot on the pipe having a reverse turn in its upper end and a cooperating cam follower fixed to the sleeve and received in the slot, the slot having a J shape with the leg of the J corresponding to the position of the platform inside the vehicle being shorter than the leg of the J corresponding to the position of the platform outside the vehicle, whereby the platform may be lowered slightly in the inside position of the platform.

3,893,577

METHOD FOR DEMOLISHING A CONSOLIDATED AND HARDENED IRON ORE POWDER BODY CONTAINED IN A HOLD OF AN IRON ORE CARRIER

Koetsu Asai, Chiba; Nobuyuki Imanishi, and Terutoshi Yamada, both of Kobe, all of Japan, assignors to Kobe Steel, Ltd., Kobe and Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Aug. 7, 1973, Ser. No. 386,328
Claims priority, application Japan, Aug. 9, 1972, 47-79591
Int. Cl. B63b *27/24*
U.S. Cl. 214—152 12 Claims



1. A method for demolishing a consolidated and hardened iron ore powder body for the purpose of facilitating unloading the same from a hold of an iron ore carrier, comprising the steps of:

placing a plurality of mechanical members within a planar array in said hold of said iron ore carrier, before the iron ore in a slurry state is charged into said hold;

loading the iron ore in a slurry state into said hold;

permitting said iron ore to consolidate and harden so as to form a dry and hardened iron ore body;

causing said mechanical members to move relative to the iron ore body in which said members are buried, at the time of unloading said iron ore from said carrier, thereby demolishing the iron ore body in a consolidated and hardened state; and

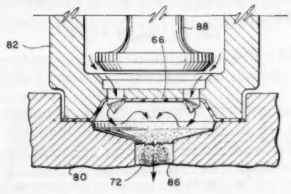
unloading said demolished iron ore body from said carrier while in said dry state.

3,893,578

SYSTEM FOR INJECTING PARTICULATE MATERIAL INTO THE COMBUSTION CHAMBER OF A REPETITIVE COMBUSTION COATING APPARATUS

Rosser B. Melton, Jr., Helotes, and Elbert M. Hubbard, Dallas, both of Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Filed Apr. 8, 1974, Ser. No. 458,884
Int. Cl. B65g *65/04*
U.S. Cl. 214—305 9 Claims



1. A system for injecting predetermined quantities of particulate coating material into a chamber of hot gases which comprises:

an elongated tape forming a plurality of discrete capsules each containing a predetermined quantity of particulate coating material, each capsule having an inlet face and an outlet face,

an inlet manifold and an outlet manifold for sequentially clamping the tape to seal the inlet face from the outlet face,

the outlet manifold having a chamber configured to permit expansion of the outlet face of each capsule and including an outlet port having an area less than the area of the outlet face of the capsule,

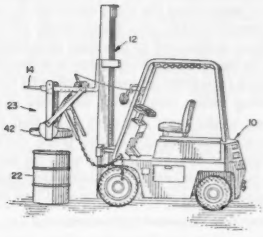
the inlet manifold including valve means for applying a pneumatic pulse to the inlet face of the capsule of sufficiently higher pressure to pass through the inlet face and burst the outlet face thereby stripping the particulate material from the tape and propelling the particulate material out through the outlet port.

3,893,579

DRUM DUMPING LIFT TRUCK ATTACHMENT

Vern K. Glewwe, Davenport, Iowa, assignor to Dozier Equipment Company, Inc., Nashville, Tenn.

Filed June 22, 1972, Ser. No. 265,355
Int. Cl. B65f *3/00*
U.S. Cl. 214—313 8 Claims



1. Apparatus for attachment to the lifting element of a lift truck mechanism for holding and dumping an open-top container having a top rim, comprising:

a. a bracket,

b. means for detachably attaching said bracket to the lifting element of a lift truck mechanism,

c. a container support frame adapted to receive and support an open-top container,

d. journal means supporting said support frame on said bracket for rotational movement about a substantially horizontal axis between an upright position and dumping position, said journal means being supported below said lifting element of said lift truck mechanism,

e. lever means on said container support frame for rotating said support frame relative to said bracket,

f. said container support frame comprising a circumferential member and rim gripping means,

g. said rim gripping means having a pair of cooperating holding elements adapted to releasably hold one side of the top rim of an open-top container received within said container support frame,

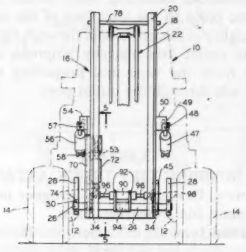
h. said circumferential member comprising at least a bearing portion spaced on the opposite side of a container received in said support frame from said rim gripping means and spaced below said rim gripping means when said support frame is in said upright position,

i. said circumferential member being adapted to, upon lowering, loosely position a container within said support frame in said upright position, said bearing portion being adapted to engage the opposite side of the container from the side gripped by said gripping means and bear a portion of the weight of said container when said support frame is rotated to said dumping position.

3,893,580
SIDE AND FRONT TILTABLE LIFT TRUCK MAST

Daryl W. Stevens, Battle Creek, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Dec. 12, 1973, Ser. No. 424,121
Int. Cl. B66f 9/20
U.S. Cl. 214—672 21 Claims

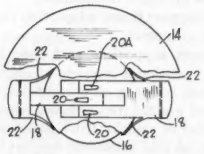


12. In a lift truck having an upright mast assembly mounted from one end of the truck, first bearing means comprising a pair of transversely spaced spherical bearings supported from the truck and supporting the mast assembly for arcuate movement both longitudinally and transversely of the truck, forward tilt means connected to the mast assembly for actuating it arcuately on said first bearing means in a direction longitudinal of the truck forwardly and rearwardly of a central position, second bearing means connecting said forward tilt means to the truck and to the mast assembly such that said tilt means pivots generally transversely of the truck during transverse arcuate movement of said mast assembly on said first bearing means, and side tilt means for actuating said mast assembly in said transverse arcuate movement on said first bearing means.

3,893,581
PILL BOTTLE SAFETY LOCK

Richard Kapphahn, 1310 Elm Ave., N., Wheaton, Minn. 56296

Filed Dec. 5, 1973, Ser. No. 421,823
Int. Cl. B65d 55/14
U.S. Cl. 215—207 3 Claims

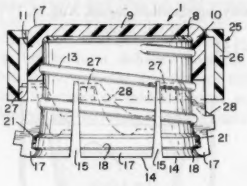


1. In combination:
a bottle having an open neck with an inwardly disposed lock ledge;
a cover removably disposed on the neck;
a tumbler body disposed in the cover with tumblers normally engaging the ledge, said tumblers having slots, all but one of the slots having like widths, said one slot being wider than all other slots; and
a bayonet key having blades, the number of blades being equal to the number of slots, all but one of the blades having like widths, said one blade being wider than all other blades, each blade being engagable with a corresponding slot with said one blade being engagable only with the said one slot whereby insertion of said blades in the slots causes the tumblers to move away from the ledge to permit removal of the cover, the cover otherwise being rotatable but not removable.

3,893,582
CHILD PROOF CLOSURE

John J. Kowalik, Glenview, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Oct. 5, 1973, Ser. No. 403,736
Int. Cl. B65d 55/02, 85/56; A61j 1/00
U.S. Cl. 215—221 11 Claims

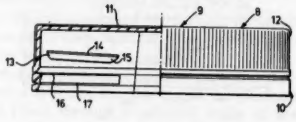


1. A childproof plastic closure for a container having a neck and a locking shoulder at the base of the neck comprising:
a cap having a skirt with an upper cylindrical portion and splayed fingers forming the lower portion;
means on the fingers for interlocking engagement with the shoulder;
holding means mounted on the cap and movable to release and locking positions and in said locking position closing the fingers about the neck and thereby forcing said interlocking means into locking relation with the shoulder to prevent removal of the cap from the associated container; and supplementary means for releasably securing said locking means in locking and unlocking positions with the cap, said holding means comprising a ring sleeved over the skirt and movable axially and circumferentially thereon over and off said fingers;
said supplementary means comprising interengaging cam means on the ring and the external sides of said fingers, said cam means on the fingers extending diagonally axially and circumferentially of the cap, and means axially spaced of the cap and being disposed at the ends of the cam means on the fingers and offset circumferentially from each other, said cam means effective to guide said ring into and out of locking position attendant to rotation of the ring in conventional manner to lock and unlock the closure.

3,893,583
TAMPERPROOF CONTAINER AND CLOSURE ASSEMBLY

Kevin William McLaren, Barnehurst, England, assignor to Johnsen & Jorgensen (Plastics) Ltd., London, England

Filed Mar. 7, 1974, Ser. No. 448,997
Claims priority, application United Kingdom, Mar. 15, 1973, 12611/73
Int. Cl.² B65D 41/34
U.S. Cl. 215—256 8 Claims



8. A container and closure assembly in which the complete closure comprises a screw cap and a retaining band to be torn away when it is desired to open the container characterised by the provision of a discontinuous external screw thread with sloping upper surfaces and straight lower surfaces around the mouth of the container for engagement by a discontinuous internal screw thread with straight upper surfaces and straight

lower surfaces provided on the screw cap, the arrangement being such that when the complete closure is being screwed on to the container there is an interlocking action between the screw threads but if an attempt be made to unscrew the complete closure there is a sliding action and the closure simply goes round and round but does not come off the container.

3,893,584

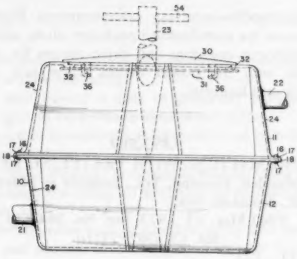
UTILITY METER CONTAINER

Jonathan Ledford, Washington, D.C., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed June 26, 1973, Ser. No. 373,673

Int. Cl. B65d *1/22;* **E05C** *19/06;* **B65d** *45/28;* **220** *4 B;4 E;5 A;5 R;18;323*

U.S. Cl. 220—4 B **1 Claim**



1. A container for the installation of a utility meter, with provisions to remove the cover of said unit by a key for the reading of the meter installed therein,

said container being formed of a molded plastic composition with a hollow top section and a hollow bottom section, both of which are formed with sloping tapered walls so as to be able to nest into each other and into similar units in the stored unassembled condition, with the edges of the top and thee bottom sections formed with flanges adaptable for joining together by means of blind rivets or bolts, and with a central opening in the top section of a shape to hold a cover plate fabricated of similar material, with said cover plate being held fast to the said top section so as to enclose the opening in said top section by means of a flat latch plate, slidably fastened to the underside of the latch plate,

the ends of said latch plate normally engaging projections fitted to the underside of the said top section and of a spring construction so that pressure applied to the latch plate, perpendicular to the plane of the latch plate acts to bend the latch plate into an arcuate shape, thus foreshortening its extended length and withdrawing the latch plate ends from engagement with the projection of the top section,

said cover plate having an opening to admit a key,

said opening located in alignment with the mid-section of the latch plate,

said key formed of a shank faced on one end with a plane surface oriented at an inclined angle to the axis of the shank and fitted with projections on the shank adjacent to the said inclined plane surface, with the opening of the cover plate shaped to admit the shank of the key and the projections, such that manual pressure on the key in the axial direction of the shank, after the inclined plane surface of the key contacts the latch plate, serves to both disengage the latch plate from engagement with the top section and to also slide the key laterally in relation to the opening and to the latch plate so as to cause the projections on the shank of the key to slide past the opening in the top cover and thus engage the underside of the cover when the manual pressure on the key is relaxed, thus freeing the cover from the top section and latching the key to the latch section, without rotation of the key.

3,893,585

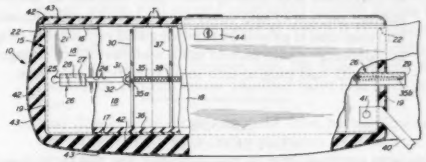
AUTOMOBILE ARM REST TAPE HOLDER

Gary N. Morrison, 333 Chase Rd., Columbus, Ohio 43214, and Stanley Roger Ward, 2356 Brentnell Ave., Columbus, Ohio 43211

Filed Oct. 29, 1973, Ser. No. 410,637

Int. Cl. B65d *57/00*

U.S. Cl. 220—22.6 **10 Claims**



1. An automobile arm rest with storage compartment for sound recording tapes comprising

An elongated body having a bottom wall, sidewalls and end walls defining an open topped cavity adapted to receive a plurality of the tapes in upstanding, serially disposed relationship, each of said sidewalls having an elongated slot extending longitudinally thereof, said body including hinge pivots interconnectable with support brackets of a vehicle seat;

a follower plate transversely disposed in said body cavity in upright relationship and movable longitudinally thereof, said plate provided with support trunnions projecting laterally from each side thereof into a respective slot of an adjacent sidewall and movable longitudinally thereof; spring means interconnected between said body and said follower plate biasing said follower plate toward one of said body end walls, and

a cover hingedly connected with said body and selectively positionable in closing relationship to the open top of said body cavity, said body and cover including latch means cooperatively interengageable to maintain said cover in closed relationship to said body.

3,893,586

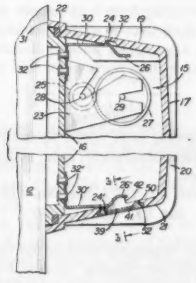
TAMPER-PROOF CASE FOR METER OR REGISTER

Ralph A. Derose, Villa Park; Anthony W. Rigazio, Oglesby, and George V. Zimmerman, St. Charles, all of Ill., assignors to Neptune International Corporation, Atlanta, Ga.

Filed May 10, 1974, Ser. No. 468,729

Int. Cl. B65d *45/16*

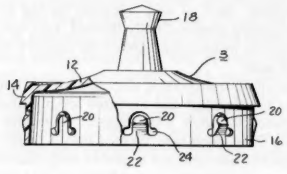
U.S. Cl. 220—324 **6 Claims**



1. A tamper-proof case for a meter or other device comprising:

a base member adapted to be secured to a surface;
a cover, respective portions of which are adapted to be secured to said base member, said cover having a plurality of opposing sides, a top; and, a hole in one side;
a first latch member secured to said base within said cover, said first latch member adapted to cooperate with a recess in said cover to secure a portion of said cover to said base;
a second latch member positioned opposite said first latch member; and,
a replaceable plug positioned in said hole in said cover in proximity to said second latch member, said plug adapted to cooperate with said second latch member to secure another portion of said cover to said base whereby access into said case is gained by rupturing said replaceable plug and depressing said second latch member out of engagement with said plug to free said cover from said base.

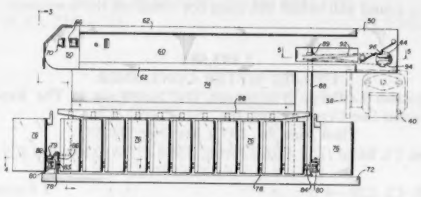
3,893,587
COFFEEMAKER LID
Joseph Frank Loch, R.D. 1, Center Valley, Pa. 18034, assignor to General Electric Company, Bridgeport, Conn.
Filed Nov. 5, 1973, Ser. No. 412,617
Int. Cl. B65d *43/08*
U.S. Cl. 220—356 **6 Claims**



1. A utensil comprising:
a. a container having a top opening and a downwardly extending inside wall;
b. a lid for closing said top opening having a top wall larger than the top opening of said container and a molded plastic skirt wall extending downwardly from the top wall, said skirt wall being generally smaller than the top opening of said container so that it may extend within the container, and said skirt wall having upper and lower wall portions;
c. a plurality of lid retaining fingers integrally formed with said skirt wall, said fingers being integrally formed with the lower wall portion of said skirt and extending upwardly from the lower portion of said skirt for gripping the downwardly extending inside wall of said container when the lid is positioned on said container; and
d. the lower wall portion of said skirt extending a significant distance downwardly from said fingers and the wall portion of said skirt that extends downwardly from said fingers having a generally smooth circular outer surface and being thinner than portions of said fingers.

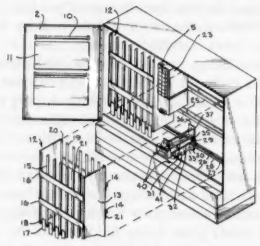
3,893,588
VENDING MACHINE MODULE
James Edward Patrick, Mayflower, Ark., assignor to Polyvend, Inc., Conway, Ark.
Filed Nov. 12, 1973, Ser. No. 414,751
Int. Cl.[2] G07F *11/00*
U.S. Cl. 221—85 **6 Claims**

1. A merchandise dispensing module for vending machines having an elongated merchandise module housing including trackways and an associated power means mounted therein comprising an elongated inverted U-shape structure including flanges for slidable mounting in the trackways of the housing to be substantially encompassed thereby; a merchandise supporting platform depending from said U-shaped structure and including a discharge opening; an endless chain arranged on driving and driven sprockets mounted on said module just above said platform; a plurality of vertically disposed, open



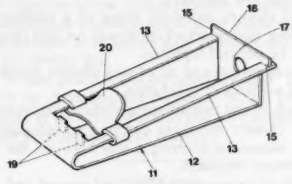
ended merchandise-receiving compartments fixed to said chain to move the merchandise packages along said platform to said discharge opening; and drive means for said chain connectible with the power means when said module is mounted in said housing.

3,893,589
VENDING MACHINE WITH TRAVELING RELEASE
Darla R. Mandell, Houston, Tex., assignor to Marrick Industries, Inc., Houston, Tex.
Filed Mar. 23, 1973, Ser. No. 344,449
Int. Cl. G07f *11/10*
U.S. Cl. 221—123 **13 Claims**



1. A vending apparatus comprising
a cabinet having two hinged doors,
two storage racks having a plurality of vertical chutes therein said racks being spaced apart and mounted in said cabinet and positioned behind said doors
a plurality of moveable holding latch means, each associated with one of said chutes at the lower end thereof and projecting into said chutes for supporting items in said chute;
a releasing and receiving means slidably mounted on longitudinal rods below and in cooperative alignment with said racks for receiving and delivering vended items, said releasing and receiving means having a platform, a means for moving said platform horizontally to a predetermined location below a chute comprising a stepper motor operably connected to a cog wheel, said cog wheel being functionally associated with a track, and means to actuate said moveable holding latch means associated with said chute for withdrawing said holding latch from said chute to allow an item to drop from said chute on to said platform and
a plurality of blocking means each associated with a chute for holding items above the first item in said chutes when said first item is released therefrom, said holding latch means and said blocking means being independently pivotally mounted on said chutes.

3,893,590
TUBE COMPRESSOR
Demitri Paroussiadis, 23B Tontine St., Folkestone, England
Filed Feb. 1, 1974, Ser. No. 438,718
Int. Cl. B65d *35/28*
U.S. Cl. 222—103 **4 Claims**



1. A tube holder comprising a generally V-shaped holder for receiving a tube including:

a first arm having a pair of generally parallel members arranged to lie on each side of the tube;

a second arm formed of a solid member to provide a support for said holder;

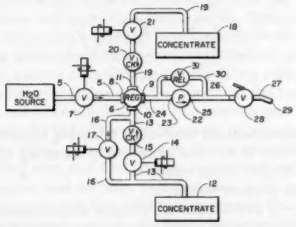
an apertured member arranged across said first and second arms and containing an aperture for receiving the nozzle of said tube;

a slidable member engaging and bridging said parallel members and slidable therealong, said slidable member being curved to facilitate actuation of said slidable member toward said apertured member;

means for resiliently urging apart said arms; and

step formation means on said apertured member for restraining separating of said arms, said arms being movable together upon depression of said slidable member toward said tube during actuation of said slidable member toward said apertured member to cause emission of the contents of said tube.

3,893,591
HIGH PRESSURE SPRAY WASHING SYSTEM
Gerald L. Hockmuth, and Iven R. Norstrud, both of Britt, Iowa, assignors to Britt Tech Corporation, Britt, Iowa
Filed Feb. 11, 1974, Ser. No. 441,377
Int. Cl. B67d *5/14*
U.S. Cl. 222—1 **22 Claims**



1. In a high pressure washing system,

a. positive displacement pump having a liquid inlet and a liquid discharge outlet;

b. means for operating said pump to cause the same to draw liquid thereinto at its inlet and to discharge such liquid through its discharge outlet;

c. flow directing means connected to said pump outlet for directing the flow of such liquid against a surface to be cleaned;

d. conduit means connected with said pump inlet and having an intake adapted to be connected to a source of water;

e. a pressure-sensitive flow control device interposed within said conduit means and sensitive to the downstram pressure within said conduit means and having a variable flow-control orifice;

f. second conduit means connected in fluid communicating relation with said first mentioned conduit means at a point between said pump and the point of control of said control device and having an intake adapted to be connected to a source of liquid cleaner;

g. a valve movable between open and closed positions interposed within said second mentioned conduit means between its intake and the point at which it is connected with said first mentioned conduit means for permitting said pump to draw cleaner into the flow of said first mentioned conduit means when the valve is in open position;

h. said flow control device and said valve having flow control orifices the combined dimensions of which at all times are insufficient to permit said pump to operate at rated capacity, whereby said first mentioned conduit means is always subjected to a negative pressure when said pump is operating;

i. said flow control device including down-stream pressure-sensitive control means located down-stream of said control device flow control orifice and constructed and arranged to vary its flow control orifice dimensions to increase the same when the downstream pressure decreases and decrease the same when the down-stream pressure increases to thereby maintain a constant negative pressure in said first mentioned conduit means between said pump and said control device irrespective of changes which may take place in the pressure at which the water may be supplied to said first mentioned conduit means.

8. A method of accurately metering proportions of a plurality of liquid components of a mixed cleaning solution within the fluid line of a high pressure washing system wherein the source of one of the components is furnished under variable pressures, consisting in:

a. providing a positive action displacement pump having a fluid inlet and outlet;

b. connecting the inlet of the pump by conduit with a constant pressure source of one of the liquid components of the solution to be mixed;

c. concurrently connecting the fluid inlet of the pump by conduit to the variably pressurized source of liquid component;

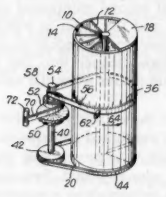
d. restricting the flow of the liquid from the first source to less than that at which the pump is rated, and

e. variably restricting the flow to the pump from the source of the second liquid component sufficiently to create a pressure of essentially zero at the point of restriction when the pump is not operating and to produce at all times when the pump is operated a combined flow from the two sources of less than that at which the pump is rated.

3,893,592
MEASURING AND DISPENSING APPARATUS
Louis T. Friedman, 2 Leonard St., Farmingdale, N.Y. 11735
Filed Oct. 29, 1973, Ser. No. 410,420
Int. Cl. B67d *5/30;* **G01f** *11/26*
U.S. Cl. 222—14 **15 Claims**

1. Apparatus comprising a source of flowable material, passage means having a sequence of parallel passages adapted for being fed by said source, said passages having inlets and outlets, first blocking means displaceable to obturate selected of said inlets whereby to prevent feeding of the associated passages from said source while the remainder of said inlets are open so that the corresponding passages can be fed from

said source, second blocking means to obturate selected of said outlets constituting less than all of the same but including at least those of said outlets associated with the passages whose inlets are not obturated by said first blocking means, and drive means for the concomitant driving of said first and second blocking means to displace the same relative to said sequence of passages whereby said material can flow into selected passages and out of selected passages but is prevented from flowing from said source directly through any of the passages; said drive means including control means displaceable through distances corresponding to selectable numbers of said passages, storage means to store energy corresponding to



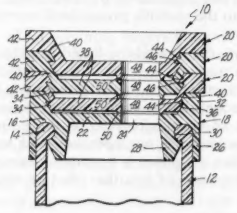
the displacement of said control means, coupling means effective on release of said control means and responsive to said storage means to drive the first and second blocking means across said inlets and outlets to release material from the selected number of passages and to permit the recharging of the passages from said source, and scale means cooperatively related to said control means whereby displacement of said control means can be related to selectable amounts of said material, said control means including a drive mechanism, means for manually displacing said drive mechanism, a shaft driven by said drive mechanism, and a spring loading said shaft to return the same to a normal position of rest.

3,893,593

CHILD-RESISTANT CLOSURE USING A PLURALITY OF ROTATABLE CLOSURE MEMBERS

Robert E. Hazard, North Kingstown, R.I., assignor to Polytop Corporation, Slatersville, R.I.

Filed Oct. 29, 1973, Ser. No. 410,973
Int. Cl. B67d 5/22
U.S. Cl. 222—48 **2 Claims**



1. A dispensing closure having a base including a first closure member and a dependent means for attaching said base to a container located around the periphery of said first closure member, said closure also having a second closure member rotatably mounted on said first closure member so as to be capable of being rotated about an axis, said first and said second closure members having openings extending therethrough which are offset from said axis, said second closure member being capable of being rotated so as to bring the opening therein into alignment with the opening in said first closure member in which the improvement comprises:

at least one additional closure member rotatably mounted adjacent to said second closure member, each additional closure member also having an opening formed therein which is offset with respect to said axis,

each of said closure members having integral interlocking means for securing said second and said additional closure member together on said first closure member so as to form a stack of said closure members, said interlocking means holding said members against axial movement away from one another,

all of said closure members being of a resilient material permitting said interlocking means on said closure members to be popped together,

the adjacent surfaces of all of said closure members being parallel surfaces of revolution,

one of each of the two adjacent surfaces between adjacent of said closure members carrying an integrally formed sealing means for forming a seal between the two adjacent closure members,

said interlocking means holding said second and said additional closure members so that each of said sealing means resiliently engages the adjacent surface of the next adjacent closure member,

said interlocking means holding said second and said additional closure members so that each of them can be independently rotated completely around said axis,

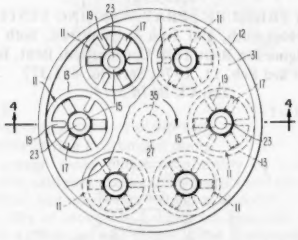
the exteriors of all of said closure members being exposed to the exterior of said dispensing closure so that said closure members are capable of being manually engaged, said closure members being capable of being independently rotated so that the openings of all of said closure members are in alignment in order for material to be moved through said closure.

3,893,594

ROTARY DEVICE TO CONTROL OPERATIONS IN AN INCREMENTALLY CONTROLLED METERING SYSTEM

Joseph C. Carbine, Wyncote, and Edward A. Wojtowicz, Bryn Mawr, both of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed May 15, 1974, Ser. No. 470,182
Int. Cl. B67d 5/10
U.S. Cl. 222—76 **6 Claims**



1. In an incrementally controlled metering system, a rotary device effective to control incremental metering operations, said rotary device comprising:

a rotatable support wheel;

a plurality of molded unitary bistable means equally spaced within said support wheel near the circumference thereof, each of said bistable means including a member reciprocatably movable axially to one position in an active state from a normal second position in an inactive state to initiate rotation of said rotatable support wheel and further including pivotable means connected to said reciprocatable member and said support wheel for maintaining said reciprocatable member in either its active state or its inactive state;

a plurality of stationary control means located at spaced positions contiguous to said support wheel adjacent to the circumference thereof for cooperation with said recipro-

catable members, said plurality of control means being equal in number to said plurality of bistable means, said control means at all but one of said positions adapted to set a selectable reciprocatable member of one of said plurality of bistable means into its active state, said control means at said position not occupied by said setting control means adapted to reset said selectable reciprocatable member of one of said plurality of bistable means in its active state into its inactive state when said reciprocatable member in its active state is positioned in juxtaposition therewith; and

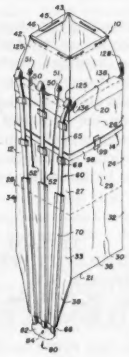
means at said position not occupied by said setting control means for detecting the presence of said reciprocatable member in its active state to cause cessation of rotation of said rotatable support wheel.

3,893,595

SUSPENDED FLEXIBLE CONTAINER WITH LATCHED BOTTOM OPENING

Jitendra Khanna, and Desmond Williams, both of North Vancouver, Calif., assignors to False Creek Industries Ltd., Vancouver, Calif.

Filed Sept. 21, 1973, Ser. No. 399,371
Int. Cl. B67d *5/64*
U.S. Cl. 222—185 **24 Claims**



15. Transporting container apparatus including a container in the form of a bag having a closable top, first and second opposed walls, a tube-like bottom connected to said walls and foldable over and across the bottom area of the bag and upwardly along said first wall; and a cradle fitting around said bag and comprising a first section extending from near the top of the bag down along said second wall thereof and over said bottom to extend therewith upwardly along said first wall, a second section overlying said first wall near the top of the bag, lifting means connected to said first section and said second section near the top of the bag by means of which said apparatus can be lifted, releasable latch means extending between and coacting with said first section and second section releasably to secure said sections together, said latch means, when unreleased, and said first section preventing the bag bottom from straightening out to discharge material from the bag when the latter is supported by means of the cradle.

3,893,596

UPRIGHT-INVERTED AEROSOL DISPENSER

Steven W. Beres, and James L. Gentile, both of Bridgeport, Conn., assignors to VCA Corporation, Greenwich, Conn.

Filed Feb. 25, 1974, Ser. No. 445,734
Int. Cl. B65d *83/14*
U.S. Cl. 222—402.19 **3 Claims**

1. An aerosol dispenser of the hand-held type, comprising in combination:

a. a container and dispensing valve carried at the top thereof for controlling the discharge of its contents,

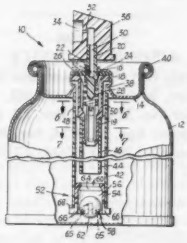
b. an outer dip tube,

c. means connecting one end of said outer dip tube to said dispensing valve,

d. an inner dip tube freely disposed inside said outer dip tube, connected at one end to and communicating with said dispensing valve,

e. said dip tubes being coextensive and having spaced-apart annular wall portions defining an annular channel therebetween,

f. a check valve connected to the other end of said outer dip tube and having a port communicating with said annular channel,



g. said check valve being disposed adjacent the other end of said inner dip tube,

h. said check valve having a gravity actuated valve part which moves in response to tilting of the container to upright and inverted positions respectively,

i. that end of said inner dip tube which is adjacent the check valve being free from and unattached to said check valve,

j. said dispensing valve having means thereon enabling communication to be had between the annular channel defined by the dip tubes and the upper area in the container, and

k. said check valve closing off said other end of said outer dip tube when the container is in an inverted position and opening said other end when the container is upright.

3,893,597

LOW DELIVERY RATE VALVE

Ronald F. Ewald, 2700 Cardinal Dr., Rolling Meadows, Ill. 60008

Filed Aug. 20, 1973, Ser. No. 389,729
Int. Cl. B65d *83/14*
U.S. Cl. 222—402.22 **14 Claims**

1. A low delivery rate aerosol valve for use in combination with an aerosol disperser comprising a valve body including an enlarged upper portion and a lower portion connected to said upper portion, said enlarged upper portion including a valve body cavity formed on the interior of said valve body, restricted feed passage means formed in said lower portion in fluid communication with said valve body cavity, a valve stem movably mounted within said valve body cavity to open and

close the valve, said restricted feed passage means comprising a plurality of expansion chambers and a plurality of restricted channels, said plurality of expansion chambers disposed in substantially successive relation to one another, each two successively disposed expansion chambers interconnected by at least one of said plurality of restricted channels, said successively arranged plurality of expansion chambers and plurality of restricted channels disposed in predetermined flow reversing relation to one another so as to substantially reverse the main fluid flow through said restricted feed passage means, said restricted feed passage means disposed in fluid communicating relation between said valve body cavity and the interior of the dispenser, whereby upon actuation of the valve the contents of the dispenser pass through said restricted feed passage means to the atmosphere.

3,893,598

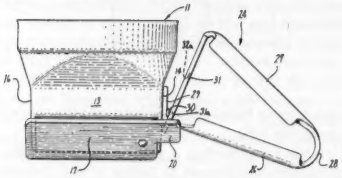
DISPENSING DEVICE

Gunter G. Fuss, Daly City, Calif., assignor to Free-Flow Packaging Corporation, Redwood City, Calif.

Continuation of Ser. No. 314,583, Dec. 13, 1972, abandoned. This application Apr. 1, 1974, Ser. No. 456,453

Int. Cl.[2] B65D *47/08, 47/20*

U.S. Cl. 222—473 **16 Claims**



1. A dispensing device, said device comprising a dispensing housing having side walls forming a generally rectangular dispensing opening, a pair of dispensing flap means pivotally carried by opposed parallel side walls of said housing forming said dispensing opening, said flap means being mounted for pivotal movements about parallel pivot axes as respects said opposed parallel side walls between a first material restraining position and a second substantially open material dispensing position, biasing means to normally hold said flap means in said first position, tab means carried by said flap means, and pivotally operable actuating means carried by a transverse side wall of said housing as respects said opposed parallel side walls, said actuating means comprising pivotally operable squeeze handle means formed to be responsive to squeezing pressures exerted thereupon and camming means operable with respect to said tab means in a plane which is generally transverse to the planes of said opposed parallel side walls, said camming means contacting said flap means to move the same in a camming action between said first and second positions.

3,893,599

MEANS FOR DISPENSING

Peter Leslie Birell, Delta, Calif., assignor to The Cornelius Company, Anoka, Minn.

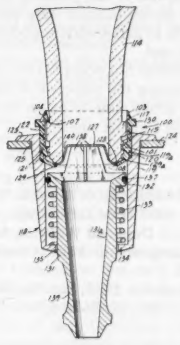
Division of Ser. No. 300,505, Oct. 25, 1972, Pat. No. 3,828,973. This application Oct. 17, 1973, Ser. No. 407,260

Int. Cl. B67d *3/00*

U.S. Cl. 222—518 **15 Claims**

1. A dispensing closure assembly for the discharge end of a container for use with a separate dispenser mechanism, comprising:

a. a unitary diaphragm-like closure member for being only initially attached to the container, said closure member having a peripheral margin with a free shape conforming to the mouth of the container for resealing engagement therewith, said closure member forming with the mouth an axially displaceable loose flow controlling element as soon as the initial attachment thereof has been released to provide a dispensing opening around the entire closure member, said closure member having a central body portion with a configuration adapted to the shape of axially movable support structure on the separate dispenser mechanism for engagement with the loose closure member; and



b. a cap for surrounding the closure member on the container and having means by which the cap can be secured to the separate dispenser mechanism, said cap having means by which it can be secured to the container and means to provide only the initial attachment of said closure member on the container, said cap being axially displaced to release such initial attachment means in response to its first axial displacement to enable the closure element to be thereafter positioned by the support structure.

3,893,600

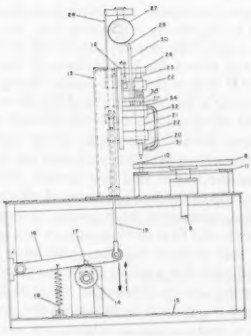
LIQUID GRAVITY FEED SYSTEM

Walter A. Shields, Jamaica, N.Y.

Filed Apr. 24, 1974, Ser. No. 463,535

Int. Cl. B67c *3/28;* **F16l** *55/14*

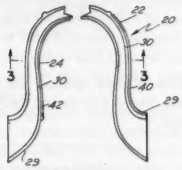
U.S. Cl. 222—529 **3 Claims**



1. In a liquid gravity feed system, a liquid reservoir having an outlet, a nozzle reciprocally supported below the reservoir, a flexible conduit connecting the reservoir outlet to the nozzle, an anvil reciprocally mounted between the reservoir and the nozzle and supporting an intermediate portion of the flexible conduit, and a clamping member carried by the nozzle above the anvil and yieldingly urged to squeeze the conduit against the anvil and close said conduit, whereby reciprocal

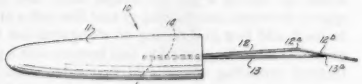
movement of the nozzle toward the reservoir will move the clamping member from the anvil and permit the flow of liquid through the conduit from the reservoir to the nozzle.

3,893,601
SPOUT CONSTRUCTION
Samuel J. Winslow, 19 Clarendon St., Providence, R.I. 02906
Filed May 14, 1973, Ser. No. 359,885
Int. Cl. B65d *5/74*
U.S. Cl. 222—566 **2 Claims**



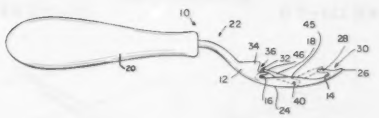
1. A liquid container comprising a hollow body, an elongated spout secured to said body through which liquid contained in said body is poured, said spout comprising a pair of elongated complementary sections formed of a metallic material that are joined together, each section extending for the length of said spout and having a concave inner surface so that a through passage is defined by said sections as located in the joined position thereof, a protective coating covering the entire inner surface of each of said sections, and means joining said sections to each other whereby a pair of oppositely disposed elongated seams are provided, each seam extending for the length of said spout, marginal mating surfaces formed on said complementary sections, the mating surface of each section having a longitudinally extending groove formed therein for receiving a solder strip that is used to join the sections together, locating pins joined to one of said sections adjacent to the marginal mating surface thereof, and complementary bores formed in the other section adjacent to the marginal surface thereof, said holes receiving said pins for aligning said sections prior to the joining thereof by soldering, said joined sections defining a finished spout completely coated on its inner surface so as to eliminate any deleterious effects of the material from which said sections are formed when the container is in use and liquid in the hollow body is poured through the elongated passage defined by said spout.

3,893,602
NEEDLE THREADER
David M. Ivy, 4635 Southern, Dallas, Tex. 75209
Continuation-in-part of Ser. No. 274,329, July 24, 1972, abandoned. This application July 2, 1973, Ser. No. 375,904
Int. Cl. D05b *87/00*
U.S. Cl. 223—99 **13 Claims**



1. A needle threader comprising a handle; a first thread engaging member secured along one end portion in said handle; a second thread engaging member secured along one end portion in said handle in juxtaposition with said first thread engaging member; said thread engaging members being flat elongated leaves of resilient material and being biased together for frictionally engaging a thread portion therebetween for pulling said thread portion through the eye of a needle; one of said leaves being longer than the other of said leaves and having a free end portion extending outwardly from said handle farther than the free end portion of said other of said leaves; and at least one of said leaves being bent along a line transversely of the longitudinal axis of said leaf providing a free end portion of said leaf converging toward the other of said leaves biasing said leaves together providing means for restraining said needle on said leaves.

3,893,603
LATCH HOOK
Joseph A. Rush, 507 E. May, Walton, Ind. 46994
Filed Apr. 26, 1974, Ser. No. 464,997
Int. Cl.² D05B *85/00*
U.S. Cl. 223—104 **7 Claims**



1. A latch hook comprising: a shank having a first projection extending from near the forward end thereof generally rearwardly above the shank to form a rearwardly open first hook; a second projection on said shank spaced rearwardly from said first hook and extending generally forwardly above said shank to form a second hook in opposed relation with said first hook; and a latch pin pivotally mounted on said shank and movable about its pivot between engagement with the ends of said first and second projections to selectively close one of said first and second hooks.

3,893,604
GARMENT CARRYING AID
Raymond O. Skinner, 6755 E. 24 St., Tulsa, Okla. 74129
Filed Feb. 20, 1973, Ser. No. 334,026
Int. Cl. A45f *5/00*
U.S. Cl. 224—5 N **1 Claim**

1. A garment carrying aid comprising:
an elongated flexible but substantially inelastic strap having a first and a second end and an inner and an outer surface, the strap being adapted to extend over one shoulder and obliquely across the front of the user such that the inner surface contacts the user;
a releasable clamp connected to said first end of the strap and adapted to clamp to the belt or top of the trousers at the front of the user with the strap extending upwardly across the chest and over one shoulder;
a terminal portion of the strap adjacent the second end being folded and secured to define a loop at said end of the strap to receive garment carrying hanger hooks;
non-slip surface means affixed to the strap inner surface over a portion of the length of the strap adjacent the loop, the length of the strap being proportioned to the user

such that the non-slip surface is positioned over the shoulder of the user and said loop portion hangs over the back of the user when the clamp is attached to the belt or trouser top in the front of the user; and

a flat protector pad affixed to the inner surface of the strap adjacent the loop, the pad being parallel to and below the loop and wider than the strap, the pad serving to protect the user and his clothing from hooks of garment hangers or the like received in said loop.

3,893,605

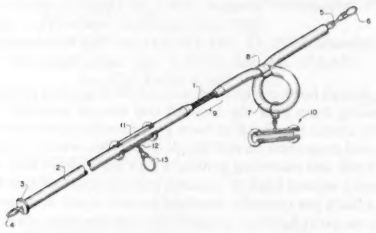
FISH STRINGER

James T. Mew, Kings Lakeside Terr., Rt. 1, Viola, Mo. 65748

Filed Aug. 20, 1973, Ser. No. 383,619

Int. Cl. A45f *3/00*

U.S. Cl. 224—7 D **1 Claim**



1. A fish stringer comprising a flexible cable of small diameter, a coating of flexible material adhered thereto to present an elongated flexible assemblage of relatively large diameter, means at one end of said flexible assemblage to secure it to a selected support, stop means at the other end, a plurality of snap hook and slider elements each of said snap hook and slider elements to successively receive a caught fish, said slider elements each comprising a slotted tubular element, the elongated flexible assemblage being reduced in diameter by the thickness of said coating to the diameter of said flexible cable for a short length near the means to secure it to a selected support, the width of the slot in said tubular element being approximately equal to the diameter of said flexible cable, and the inside diameter of said tubular element being such as to slide freely along said flexible assemblage, but of less diameter than said stop means, and a loop formed on said flexible assemblage between said means to secure it on a selected support and said short length of reduced diameter for removably carrying extra snap hook and slider elements.

3,893,606

PORTABLE CARRIER APPARATUS

Gary L. Hofmann, 2702 Ardmore Ave., Manhattan Beach, Calif. 90266

Filed Sept. 26, 1973, Ser. No. 400,850

Int. Cl. B60r *7/00*

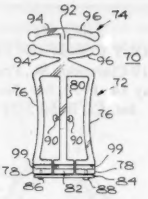
U.S. Cl. 224—42.1 F **6 Claims**

1. An improved ski carrier rack assembly, said assembly comprising a pair of racks which define longitudinally spaced channels and at least one pair of ski holders, each of said holders including:

a. means for releasably securing said holder to one of said channels;

b. a ski support member including a pair of spaced and vertically depending resilient legs, wherein said legs include, adjacent the lower ends thereof, transversely extending inwardly directed ski detents adapted to be matedly received within one of said channels, said legs being adapted to releasably grip the sides of one or a pair of skis when disposed therebetween; and,

c. a ski pole support member connected to said ski support member and including a central member and a pair of



resilient arms closely spaced outwardly therefrom on opposite sides thereof to define therebetween a pair of ski pole recesses.

3,893,607

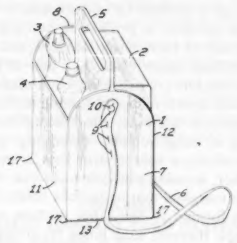
LAUNDRY SUPPLY TOTE DEVICE

John Jones, Rural Route No. 1, Box 542, Hartford City, Ind. 47348

Filed Jan. 18, 1974, Ser. No. 434,610

Int. Cl. A45c *71/00*

U.S. Cl. 224—45 R **1 Claim**



1. A means to tote commonly used laundry supplies consisting of the following:

A. A container having:

1. Two substantially similar opposite spaced apart parallel first sides,

2. Two substantially similar opposite spaced apart parallel first ends attached to said first sides having a similar height as and less width than each said first side and a button holding means located outwardly and generally centered near the top of each said first end for use in attaching and securing a shoulder strap carrying means if desired,

3. A bottom attached to said first sides and first ends,

4. A center divider handle means the substantially same width as, having a greater height than, and suitably spaced between and parallel to said first sides attached to each said first end having an elongated slot therein generally laterally parallel to said bottom with a portion thereof extending above said first sides sufficient to accommodate the insertion of a user's hand for gripping and carrying purposes,

5. An open space at the top between said center divider handle means and each said first side and first ends and B. A removable hollow laundry supply box inserted between said center divider handle means and a said side having

1. Two similar opposite spaced apart parallel second sides having a height less than said center divider handle means but greater than the said first side next to said box and a length substantially similar to but less than the said first side next to said box,

2. Two similar opposite spaced apart parallel second ends having a height equal and attached to said second sides and a width substantially similar to but less than the space between said center divider handle means and said first side between which said box is inserted,
3. A second bottom attached to said second sides and second ends which when said box is inserted rests generally upon that uppermost portion of the first bottom between said center divider handle means and said first side, and
4. A second top attached to said second sides and second ends having a suitable small first opening therein centered near one end thereof for use in pouring the laundry supply out of said box and a second larger opening therein nearer the other end thereof to accommodate an inserted portion of the following described box top cover means and

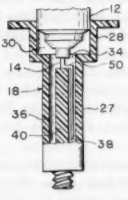
C. A removable box top cover means having
1. A closed upper portion the underside of which fits down upon and against the upper portion of the said box second top when positioned atop said box,
2. Two similar spaced apart opposite parallel third sides attached to said upper portion which extends down and over a portion of the said second sides of said box when said box top cover means is placed atop said box,
3. Two similar spaced apart opposite parallel third ends attached to said upper portion and said third sides which extend down and over a portion of the said second ends of said box when said box top cover means is placed atop said box, and
4. A measuring means, which fits down into the said second opening in said second top when said box top cover means is placed atop said box, having the top of same open and the bottom thereof consisting of a portion of the underside of said box top cover means said upper portion when said box top cover means is removed from the said box and turned over and four parallel spaced apart sides which are attached to and extend sufficiently away from the underside of said box top cover means said upper portion which have internal ribs or markings around the inside of said four sides to show the quantity of content thereof, preferrably in parts of a cup volume measure, as the user fills same with a laundry supply for measuring purposes.

3,893,608

SYRINGE WITH NEEDLE DESTROYING MEANS

Elmer A. Koenig, Kirkwood, Mo., assignor to Sherwood Medical Industries, Inc., St. Louis, Mo.

Filed June 3, 1974, Ser. No. 475,678
Int. Cl. B26f *3/00*
U.S. Cl. 225—1 **8 Claims**



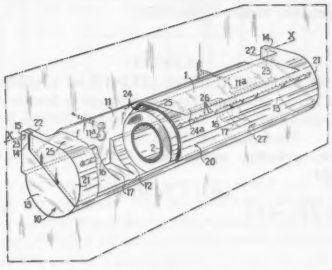
7. A method of destroying a needle of a packaged hypodermic syringe having a plurality of members in axial alignment, including a syringe barrel, a hypodermic needle connected to the distal end of said syringe barrel, a needle sheath removably covering said needle, and a piston rod connectable with a piston for moving the piston in the barrel, one of said members having a chamber offset from the axis of said one member and a recess open to said chamber and coaxial with said one member, comprising the steps of inserting the hypodermic needle into the offset chamber of said one member, moving said one member and syringe barrel toward each other with the walls of said recess effecting axial alignment between the barrel and said one member, and rotating said one member and said barrel relative to each other to twist said needle about the axis of the barrel for breaking the same and rendering it useless.

3,893,609

DISPENSER FOR PLASTIC FILM WRAP

Gerard Jamois, Nogent sur Marne, and Sylvain Bluntz, Paris, both of France, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Feb. 7, 1974, Ser. No. 440,588
Int. Cl. B26t *3/02*
U.S. Cl. 225—42 **1 Claim**



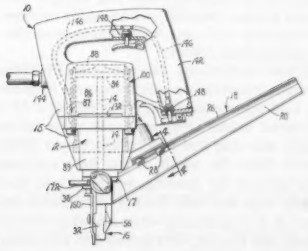
1. A dispenser device for sheet material comprising a housing adapted to be fastened to a mounting surface, means in said housing to rotatably support a roll of said sheet material, a lid articulated to the upper portion of said housing, a dispensing slit disposed in said lid adjacent to said mounting surface, and a cutting means disposed on the front surface of said lid a predetermined distance from said slit, said predetermined distance being defined by a portion of said lid that is in the same horizontal plane as said slit for at least half of said predetermined distance and that is arcuate from said horizontal plane to said cutting means to facilitate guiding, whereby said sheet material is supported from said dispensing slit to said cutting means.

3,893,610

PNEUMATIC DEVICE FOR DRIVING HEADED OBJECTS

Arthur J. Smith, P.O. Box 3898, Visalia, Calif. 93277

Filed Mar. 13, 1974, Ser. No. 450,733
Int. Cl. B27f *7/22*
U.S. Cl. 227—8 **10 Claims**



1. A pneumatic device for driving a headed object having a head and an elongated shank extended therefrom comprising:
A. a driver housing;

B. a cyclically operable ram supported within said housing for axial displacement along a rectilinear path and characterized by means including at one end thereof a face for striking the head of a headed object positioned within said path; and

C. object feeding means mounted on said housing adapted to position a headed object within the path of the ram including,

1. retainer means disposed adjacent to said rectilinear path for supporting said object in a pre-delivery disposition relative to said path with the shank thereof being extended through a reference plane intersecting the longitudinal axis of symmetry for said path, along the length thereof,

2. means including a barrel having an axial bore concentrically related to the path of said ram for receiving said headed object, and

3. means for delivering said headed object from said retainer means to said bore.

3,893,611

JIG FOR BRAZING ELONGATED HEAT EXCHANGERS

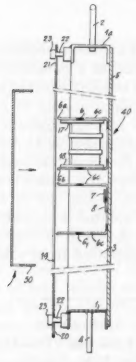
Andrè Chartet, Meudon, France, assignor to Societe Anonyme des Usines Chausson, Asnieres (Haut de Seine), France

Filed Aug. 15, 1973, Ser. No. 388,343

Claims priority, application France, Sept. 21, 1972, 72.33494

Int. Cl. B23k *19/00*

U.S. Cl. 228—44.1 **14 Claims**



1. An installation for use in brazing by gas flow elongated heat exchangers having a piling of tubes separated by corrugated fins and enclosed between side flanges, comprising:

a jig with a lower member and an upper member connected by transverse elements, said transverse elements supporting at least one holder;

said holder comprising two horizontally extending plate elements, mounted on said transverse elements and abutting said transverse elements at one end of each of said horizontal plate elements, said plate elements being slightly movable and spaced apart by a distance slightly smaller than the width of the heat exchangers placed therebetween for brazing, whereby said plate elements slightly urge said side flanges, corrugated fins and tubes together during brazing while allowing enough expansion of said side flanges, corrugated fins and tubes due to the heat of brazing to prevent deformation of said side flanges, corrugated fins and tubes;

means for passing hot gas through the corrugated fins and tubes of the heat exchanger while the heat exchanger is in said holder, and

wherein said holder is made up of two plates, an upper plate and a lower plate connected to said transverse elements through extension arms, supported on said plates and wherein said extension arms of at least said upper plate are movably mounted on said transverse elements to thereby allow at least said upper plate to move by translation in a direction substantially parallel to said transverse elements.

3,893,612

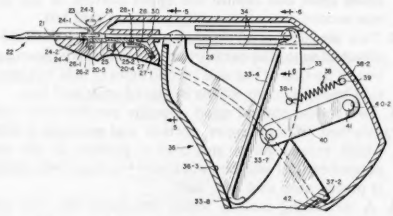
FASTENER ATTACHING DEVICE

Arnold R. Bone, Needham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed June 21, 1973, Ser. No. 372,071

Int. Cl. B65c *5/06*

U.S. Cl. 227—67 **15 Claims**



1. In an attaching device including a casing having a trigger pivotally coupled to said casing, a needle projecting from the casing, the needle having a central bore and a slot open at the top and opening into the bore, and a plunger slidable within the bore to push a portion of a fastener attachment member or the like through the bore and the slot of the needle, the improvement characterized by a lever pivotally coupled intermediate its ends to a link which is in turn pivotally coupled to said casing, a first end of the lever coupled to the plunger to reciprocate it and the second end slidable upon a camming surface of said trigger, means for linearly guiding said first lever end and resilient biasing means coupled to said casing and said lever for rotating said lever about the link thereby urging said second end of said lever against said camming surface of said trigger to resiliently bias said trigger.

3,893,613

HYDRAULIC JIG FOR CORRECTION OF MIS-ALIGNMENT

Tatuyuki Une, Hiroshima; Akira Kamata, Tokyo, both of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha and Kabushiki Kaisha Osaka Jack Seisakusho, both of Tokyo, Japan

Continuation of Ser. No. 227,905, Feb. 22, 1972, abandoned. This application May 20, 1974, Ser. No. 471,577

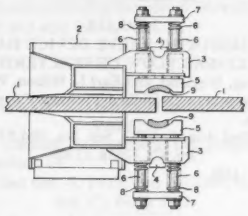
Claims priority, application Japan, Feb. 23, 1971, 46-10802

Int. Cl. B23k *1/00*

U.S. Cl. 29—200 J **2 Claims**

1. A hydraulically operated apparatus for the alignment and the holding of the terminal edges of a pair of elongated workpieces that are to be welded together, characterized by a transportable jig provided with a U-shaped groove for receiving and supporting said workpieces, a pair of vertically spaced arms disposed on the vertical sides of said U-shaped groove, said arms extending beyond the terminal area of said workpieces and in spaced normal relationship to the sides of said workpieces and on either side thereof, each of said arms being provided with a hydraulic jack having a supporting member positioned to overlie the joint between the free edges of said workpieces, a pair of columns, each of said columns being

connected between one of the pairs of said vertically spaced arms at the supporting member and cooperating with each



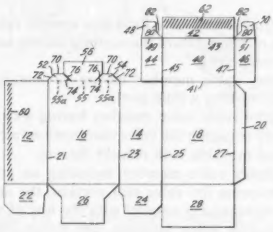
jack for preventing application thereto of eccentric loads during operation of said jacks to align the joint.

3,893,614

TAMPERPROOF RECLOSABLE CARTON

George Leroy Meyers, Menasha, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Nov. 23, 1973, Ser. No. 418,360
Int. Cl. B65d *5/54, 5/68, 17/24*
U.S. Cl. 229—51 TC **5 Claims**



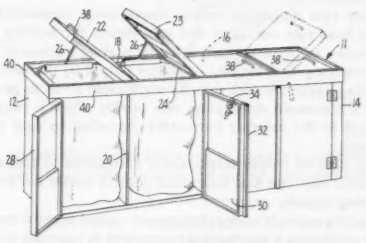
1. A tamperproof reclosable carton formed of a single suitably cut and scored blank having a receptacle portion and a cover portion which telescopes over the upper edges of the receptacle portion, said receptacle portion comprising hingedly connected front, rear, end and bottom receptacle panels, said cover portion comprising a top cover panel hingedly connected to the upper edge of said rear panel, end cover panels and a front cover panel all hingedly connected to said top cover panel and forming skirt portions parallel and adjacent to the respective underlying receptacle panels, a sealing tab hingedly connected along a detachable line of weakness to the center portion of the upper edge of said front receptacle panel and folded ouwardly along said hinge line to lie sandwiched between said front cover panel and said front receptacle panel, said sealing tab being adhesively secured to the inner surface of said front cover panel; a pair of locking tabs hingedly connected to the upper edge of said front receptacle panel in flanking relationship to said sealing panel, said locking tabs being folded about their respective hinge connections to lie sandwiched between siad front cover panel and said front receptacle panel; a pair of cover front glue flaps each hingedly connected to a respective one of said end cover panels and adhesively secured to the inner surface of said front cover panel to lie sandwiched between said front receptacle panel and said front cover panel in the same plane as said sealing tab and said locking tabs; said locking tabs each having at least one side edge thereof lying at an acute angle to said hinge line between said locking tab and said front receptacle panel, said side edge being in edge to edge locking abutment with a complementary edge formed on one of said glue flap and sealing tab carton elements lying in the same plane as said locking tab.

3,893,615

MULTIPLE COMPARTMENT REFUSE CONTAINER

William R. Johnson, Santa Cruz, Calif., assignor to Peerless Portable Metal Buildings, Inc., Santa Cruz, Calif.

Filed Nov. 1, 1973, Ser. No. 411,680
Int. Cl. B65d *91/00*
U.S. Cl. 232—43.2 **1 Claim**



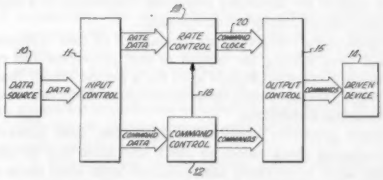
1. In an above-ground container for refuse and the like comprising a rectangular box-like structure divided into a plurality of compartments by partitions, each of said compartments being provided with a top surface with an opening for inserting refuse and an upstanding rim surrounding said opening, a top raising hinged door with a downward depending flange along each edge, said door normally held in a closed position solely by gravity to cover said opening and said rim, and a handle retractable by gravity, and a side door whereby a receptacle within the container can be filled through the top door and the contents removed through the side door, the improvement comprising a second rim closely surrounding all sides of the top door, said rim rising from said top surface to a height approximately equal that of the top surface of the door whereby an animal or the like cannot get its claws under said handle or the edges of said door to raise the door.

3,893,616

SPEED CONTROL FOR ELECTROMECHANICAL PLOTTERS

Robert B. Trousdale, Santa Ana, Calif., assignor to California Computer Products, Inc., Anaheim, Calif.

Filed Nov. 23, 1973, Ser. No. 418,367
Int. Cl.[2] **G06F** *15/46;* **G05B** *19/18*
U.S. Cl. 235—151 **9 Claims**



1. A system for driving electromechanical devices comprising:

a data source including a means for supplying data for modifying the velocity and acceleration profile parameters;

an input control unit responsively connected to said data source including means for buffering and means for transferring signals from the data source;

command control means responsively connected to said input control unit for transforming source data into command sequences;

a rate control unit responsively connected to said input control unit and said command control means including a means for generating a variable command clock said rate control unit comprising:

a base rate oscillator;

velocity register means for storing a digital number which represents the scaling exponent portion of a velocity constant;

means for holding the coefficient portion of the velocity constant;

velocity rate multiplier means responsively connected to said base rate oscillator and said means for holding the velocity coefficient and velocity scaling exponent for multiplying the base rate oscillator output by the velocity scaling exponent and velocity coefficient so as to generate a command clock pulse rate profile which is proportional to the velocity parameters supplied by said data source;

output control means responsively connected to said rate control unit and said command control means for transferring signals;

means responsively connected to said output control means for producing a mechanical movement in response to the signals transferred by said output control means.

3,893,617

FAILURE DETECTING SYSTEM FOR DEVICES EMPLOYING DIGITAL PARALLEL-TO-SERIES CONVERTERS

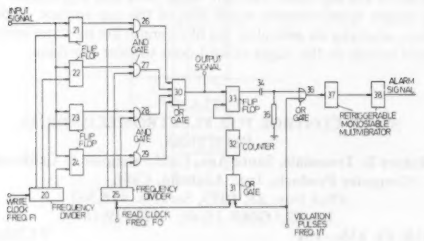
Bjorn Ragnar Solberg, Oslo, Norway, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 22, 1974, Ser. No. 462,704

Claims priority, application Italy, July 11, 1973, 26438/73

Int. Cl. G06f *11/00;* **H03k** *13/32*

U.S. Cl. 235—153 A **2 Claims**



1. A system for detecting abnormal conditions in a digital parallel-to-series converter comprising:

a digital store connected to the output of said converter, said store storing the output of said converter and producing a constant logical level for a period longer than a certain threshold time upon occurrence of any one of said abnormal conditions;

A clock generator coupled to said store, said generator producing clock pulses to clock said store and to cause said store to produce said constant logic level upon occurrence of any one of said abnormal conditions, said clock pulses having a nominal period of Xn/f_o, where n equals the number of parallel input channels, f_o is the digit rate of serialized data and X is any positive integer, with the time period between two successive ones of said clock pulses being instantaneously shifted to $Xn/f_o + k/f_o$, where k is a positive or negative integer, and the time between said shifts may occur periodically or non-periodically as long as the time between two of said shifts is larger than a certain minimum value; and

a detector coupled to the output of said store to generate an alarm signal upon detecting repeatedly said constant logic level lasting longer than said threshold time.

3,893,618

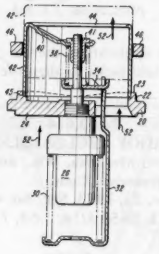
THERMOSTATIC VALVE DEVICE HAVING NON-LINEAR FLOW CHARACTERISTICS

Backman Wong, Wayland, and Earl L. Wilson, Wellesley, both of Mass., assignors to Standard-Thomson Corporation, Waltham, Mass.

Filed Aug. 1, 1973, Ser. No. 384,519

Int. Cl. G05d *23/02*

U.S. Cl. 236—100 **13 Claims**



1. A thermally responsive fluid flow control valve device for elimination of temperature fluctuations during initial opening operation comprising:

a stationary valve member having an annular valve seat portion forming a fluid port,

a linearly movable valve member having a closure portion normally engaging the valve seat portion to close the fluid port and movable with respect thereto,

the stationary valve member including an annular flange encompassing the valve seat portion, the annular flange being substantially parallel with the line of movement of the movable valve member, the flange having an end spaced from the annular valve seat portion, the end having an inclined part so that initial movement of the movable valve member creates a small fluid flow passage between the inclined part and the movable valve member and increased movement of the movable valve member is non-linear with respect to the fluid flow passage created, thermally responsive actuator means,

means joining the thermally responsive actuator means to the movable valve member for movement thereof with respect to the stationary valve member.

3,893,619

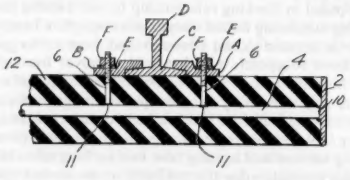
CROSSTIE FOR RAILROAD TRACK

A. J. Bruner, 2166 Katherine St., Fort Myers, Fla. 33901

Filed Oct. 18, 1972, Ser. No. 298,772

Int. Cl. E01b *3/00*

U.S. Cl. 238—83 **3 Claims**



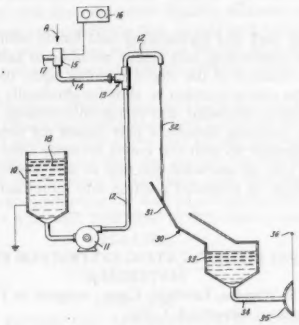
1. A crosstie for railroad tie plates and tracks comprising an elongated block of elastomeric material having a flat top and

opposite flat ends, a pair of plates each positioned on a different one of said flat ends of said blocks, at least on cross-rod attached to and extending laterally of and between said plates and longitudinally through said block and rods attached to said cross-rod and extending therefrom laterally of and from said cross-rod and said block.

3,893,620
ELECTROSTATIC ATOMIZATION OF CONDUCTIVE PAINTS

Abdullah M. Rokadia, Schaumberg, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed Oct. 4, 1973, Ser. No. 403,364
Int. Cl. B05b *5/02*
U.S. Cl. 239—3 **1 Claim**



1. A method for electrostatically spraying an electrically conductive aqueous paint comprising supplying an unconfined continuous column of said paint through an intervening air space to an electrically isolated paint reservoir, and then conveying said aqueous paint from said electrically isolated reservoir as a confined column in a paint supply line to an electrostatically charged atomizing device so that said electrostatic charge is conducted back through said paint to the electrically isolated paint reservoir to create a charged field around said reservoir, the paint providing said unconfined continuous column supplied to said reservoir being released to provide said unconfined column from a point at least about 2 feet above said reservoir.

3,893,621
PLASTIC SPRAY GUN

Jay Johnson, 5350 Tessen Dr., La Canada, Calif. 91011

Filed Jan. 24, 1974, Ser. No. 436,028
Int. Cl. B05b *7/14, 7/08*
U.S. Cl. 239—9 **14 Claims**

1. A spray gun for spraying fiberglass and liquid resins, comprising:

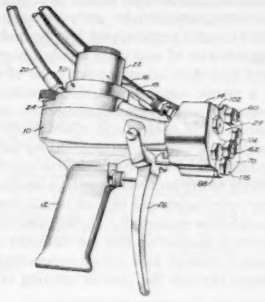
means having an opening for discharging a stream of air and solid particles into the atmosphere,

air atomizing nozzle means positioned adjacent the opening, means connecting low pressure liquid catalyst and low pressure air to said nozzle means for providing an air atomized spray of catalyst from said nozzle means,

airless nozzle means positioned adjacent the opening,

and means connecting a liquid mixture of promoted resin under relatively high pressure to the airless nozzle means to provide a liquid spray of promoted resin,

the air atomized catalyst spray and the liquid resin airless spray intersecting each other and the air and solid particle

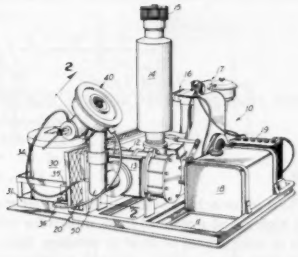


stream outside the spray gun to provide a combined spray pattern of solid particles, promoted resin and catalyst.

3,893,622
FOG GENERATOR

David W. Waldron, Valdosta, Ga., assignor to Lowndes Engineering Co., Inc., Valdosta, Ga.

Division of Ser. No. 216,396, Jan. 10, 1972, abandoned, which is a continuation-in-part of Ser. No. 20,364, March 17, 1970, Pat. No. 3,633,855. This application Jan. 14, 1974, Ser. No. 433,201
Int. Cl. A01m *17/00*
U.S. Cl. 239—77 **12 Claims**



1. A fog generator comprising:

a. an air blower means;

b. a conduit connected to said air blower means, said air blower means discharging air into said conduit;

c. a generally flat nozzle having a relatively small central opening with respect to the size of the nozzle, said nozzle being carried by said conduit, said conduit directing air from said air blower conduit and then through said central opening of said nozzle; and

d. means for introducing a liquid into said nozzle for mixing with the air passing through said nozzle;

e. said conduit including:

i. a first conduit means having a first conduit portion connected by one end to and communicating with said air blower means, said first conduit means extending generally horizontally from said air blower means,

ii. said first conduit means including a second conduit portion extending from and communicating with said first conduit portion, said second conduit portion opening generally in an upright direction,

iii. a second conduit means including a generally upright third conduit portion secured by its lower end to the open upper end of said second conduit portion, said

third conduit portion being disposed coaxially with and communicating with and being rotatable with respect to said second conduit portion,

iiii. said second conduit means including a fourth conduit portion connected to and communicating with said third conduit portion, said fourth conduit portion opening sidewise of said third conduit portion and forming with said third conduit portion an elbow,

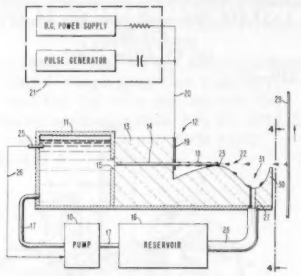
iiiii. a nozzle supporting conduit section rotatably connected to and communicating with and carried by the open end of said fourth conduit portion, said nozzle supporting conduit section having an open outer end opening sidewise of said fourth conduit section, said nozzle being secured to and extending radially across the open outer end of said nozzle supporting conduit section for essentially closing the outer end of said conduit section so that substantially all of the air directed through said nozzle supporting conduit section passes through the central opening of said nozzle.

3,893,623

FLUID JET DEFLECTION BY MODULATION AND COANDA SELECTION

Richard A. Toupin, Briarcliff Manor, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 21, 1973, Ser. No. 427,193
Int. Cl. B05b *1/08*
U.S. Cl. 239—102 **7 Claims**



1. A fluid jet switching system including jet means for producing a high speed stream of fluid, means for modulating the diameter of said stream of fluid to produce discrete droplets, a droplet deflecting surface adjacent to said stream of fluid located downstream from said jet means at a critical location adapted to contact with an impact parameter sufficient to cause capture of a drop by said convex surface and thereby deflect droplets separated from said stream within a predetermined range of distances from said jet means in response to a predetermined range of modulation.

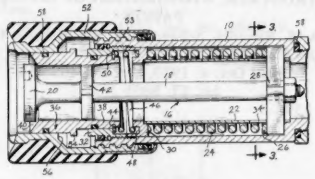
3,893,624

AUTOMATIC VOLUME ADJUSTING FIRE HOSE NOZZLE WITH FLUSHING MECHANISM

William Stanley Thompson, Elkhart, Ind., assignor to Elkhart Brass Manufacturing Co., Inc., Elkhart, Ind.

Filed Sept. 23, 1974, Ser. No. 508,064
Int. Cl. B05b *1/32, 15/02*
U.S. Cl. 239—107 **4 Claims**

1. In a fire hose nozzle including a tubular body part having an inlet end and an outlet end, a pressure responsive valve assembly shiftable in said body part and including a valve head and a valve stem, said valve head being shiftable toward and away from said body part outlet in response to variations in pressure of liquid supplied to said nozzle, the improvement comprising a barrel member having fore and aft ends surrounding said valve stem, the aft end of said barrel member fitting slidably within the outlet end of said body part, said barrel member being shiftable longitudinally relative to said body part between a forward position in which the barrel member fore end spacedly encircles said valve head to define a liquid flow path from the nozzle and a rearward position in which the barrel member fore end is shifted rearwardly of the valve head to increase the spacing between the barrel member and valve head, a sleeve member encircling the fore end of



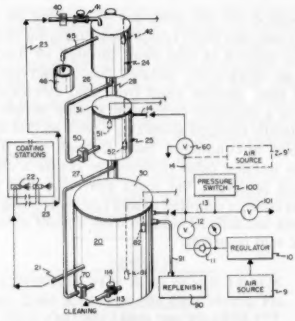
said body part and surrounding said barrel member, means rotatably connecting said sleeve member to said body part wherein rotation of the sleeve member upon the body part causes the sleeve member to shift longitudinally of the body part between extended and retracted positions, said sleeve member including abutment part means for contacting said barrel member to shift the barrel member from its forward position into its rearward position as said sleeve member is shifted from its extended position into its retracted position.

3,893,625

PUMPLESS RECIRCULATING SYSTEM FOR FLOWABLE MATERIALS

Richard F. Wiggins, Fairfield, Conn., assignor to The Gyromat Corporation, Stratford, Conn.

Filed July 1, 1974, Ser. No. 484,658
Int. Cl. B05b *9/00, 7/24;* **F17d** *1/00*
U.S. Cl. 239—127 **10 Claims**



1. A closed loop system for continuously circulating non-pumpable coating medium to a spray device, including

a. inlet line means for supplying said spray device;

b. return line means for recirculating non-sprayed medium supplied to said spray device;

c. a non-pressurized collection tank in communication with and receiving the coating material exiting from said return line means;

d. a lock tank disposed beneath said collection tank and being normally maintained at atmospheric pressure while being selectively pressurizable at predetermined times to predetermined higher pressure;

e. lock tank supply line means communicating between said collection tank and said lock tank and having a selectively actuatable lock tank supply valve included therein;

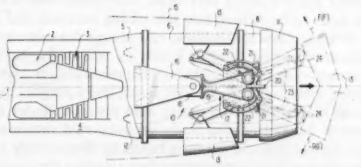
f. a pressurized source tank for supplying a coating material under pressure to said inlet line;
g. source tank supply line means extending from the bottom of said lock tank to said source tank and having a source tank supply valve included therein;
h. first air line means for pressurizing said source tank and the coating medium therein communicating between said source tank and a supply of gas under pressure;
i. second air line means communicating between said lock tank and said source of gas under pressure;
j. air line valve means selectively actuatable either to interconnect said first and second air line means or to isolate said first air line means from said second air line means while venting said lock tank to atmospheric pressure;
k. control means for said supply valves and said selectively actuatable air line valve means to normally maintain said source supply valve closed, said lock tank supply valve opened, and said lock tank vented to the atmosphere through said selectively actuatable air line valve;
l. whereby said non-pumpable coating material normally flows from said collection tank to said lock tank by gravity while said coating material is forced through the remainder of said recirculating closed loop under air pressure;
m. whereby, from time to time, said lock tank supply valve may be closed and said source tank valve may be opened and said air line valve means may be actuated selectively to interconnect said first and second air line means to equalize the pressure in said lock tank and said source tank to accommodate the flow of non-pumpable coating material from said lock tank to said source tank under gravity.

3,893,626

THRUST REVERSING APPARATUS FOR TURBOJET ENGINES

Heinrich Leibach, Grafrath-Wildenroth, and Hans Zinner, Dachau, both of Germany, assignors to Motoren-und Turbinen-Union Munchen GmbH, Germany

Filed Oct. 25, 1973, Ser. No. 409,430
Claims priority, application Germany, Oct. 25, 1972, 2252208
Int. Cl. B64c *15/06*
U.S. Cl. 239—265.19 **26 Claims**



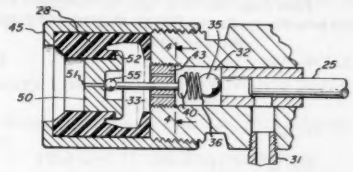
1. A jet exhaust control arrangement for controlling exhausting of gases supplied by at least one engine; said arrangement comprising:
jet pipe means for discharging gases from said at least one engine as thrust gases,
thrust reversing deflecting flap means which are movable between inoperative positions out of the path of said thrust gases and operative positions in deflecting engagement with said thrust gases for accommodating reversal of the thrust forces resulting from said thrust gases,
and baffle means disposed on said deflecting flap means for inducing asymmetric deflection of said thrust gases.

3,893,627

ELECTRIC AIRLESS CUP GUN APPARATUS

Bernard W. Siczek, Chicago, and Gene H. Hall, Westchester, both of Ill., assignors to Graco Inc., Minneapolis, Minn.

Filed Aug. 29, 1974, Ser. No. 501,851
Int. Cl. B05b *9/02*
U.S. Cl. 239—332 **17 Claims**



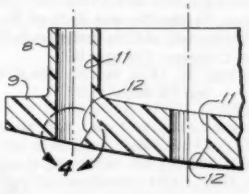
1. Apparatus for accumulating incremental fluid pulses and for developing an elevated fluid pressure therein for subsequent release to the exterior, comprising
a. means for receiving said fluid pulses, including a check valve for admitting said fluid and preventing reverse flow therefrom;
b. an accumulator chamber connected to said means for receiving, said accumulator chamber having a pressure-deformable member therein;
c. a housing having a fluid release passage therethrough, said housing seated against said deformable member, with said fluid release passage connecting the interior of said accumulator chamber with the exterior;
d. valve means for opening said fluid release passage, sealably seated in said fluid release passage and operatively connected to move from its sealably seated position under conditions of elevated pressure in said accumulator chamber;

3,893,628

SPRAY HEAD

James A. McCollum, Hillsdale, Mich., assignor to Alsons Corporation, Somerset, Mich.

Filed Apr. 8, 1974, Ser. No. 458,588
Int. Cl. B05b *1/26, 1/18*
U.S. Cl. 239—521 **6 Claims**



1. A spray head, adapted to be placed over means forming a water distribution cavity for discharge of water therefrom, the spray head comprising:
a. a disk member;
b. a plurality of discharge bores formed in the disk member;
c. a set of deflector means within selected bores adjacent the exit ends thereof, each deflector means forming with the remaining portion of the corresponding bore an asymmetrical discharge orifice; said deflecting means directing angularly a portion of the water passing through the bore to cause impingement thereof against the remaining water passing in the bore as it issues from the discharge orifice to deflect the resulting water jet in angular relation to the axis of the corresponding bore; the set of discharge means being relatively oriented and so proportioned as to

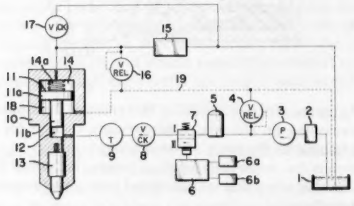
cause the water jets to produce a preselected spray pattern.

3,893,629

FUEL INJECTION DEVICE FOR DIESEL ENGINES

Kazuo Okamoto, Saitama, Japan, assignor to Diesel Kiki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 22, 1974, Ser. No. 499,591
Claims priority, application Japan, Aug. 29, 1973, 48-96954
Int. Cl.[2] B05B *1/30*
U.S. Cl. 239—585 **1 Claim**



1. A fuel injection device for Diesel engines comprising a body including a large diameter portion and a small diameter portion of a servopiston to define a piston chamber, a counter piston chamber and a plunger chamber, a pressure generating device having a relief valve at the outlet side thereof and connected to said piston chamber, said pressure generating device including a plunger with inclined notches determining period and time of pressure generating operable synchronously to rotation of an engine, a fuel tank connected to said counter piston chamber, an injection nozzle in the body connected to said plunger chamber, a check valve preventing fuel from flowing out of said plunger chamber, and electromagnetic valve for closing and opening a passage of fuel under pressure and a fuel supply pump connected at the outlet side thereof through said electromagnetic valve and said check valve to said plunger chamber, whereby said pressure generating device and said electromagnetic respectively control piston strokes in fuel injection direction and fuel intake direction.

3,893,630

SWIVEL OUTLET FOR SPRAYER OR THE LIKE

Carl E. Bochmann, Brecksville, and Richard W. Germuska, Middleburg Heights, both of Ohio, assignors to H. D. Hudson Manufacturing Company, Chicago, Ill.

Filed Mar. 29, 1974, Ser. No. 456,010
Int. Cl. B05b *15/08*
U.S. Cl. 239—587 **4 Claims**

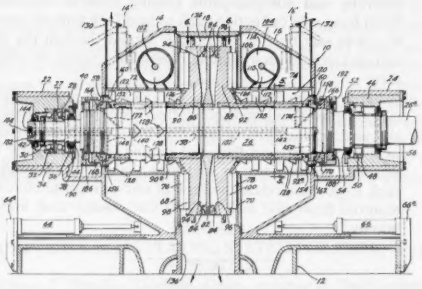
1. A swivel outlet for a sprayer discharge tube or the like comprising: a first housing member, a recessed cylindrical portion defined by surfaces of said first housing, a radial passageway extending through said surfaces to said recess, a second housing member, a cylindrical portion of said second housing sealingly mated for rotation within said recess, first passage means extending axially through said cylindrical portion to communicate with said recess, second passage means communicating with said first passage means and extending transversely thereto; and, means for removably coupling said first and second housing members, said coupling means comprising a key affixed to one of said housings and a keyway in the other of said housings, said key including portions adapted to overlie portions of said other housing.

3,893,631

TWIN REFINER WITH DOUBLE FLOATING DISCS

Chester Donald Fisher, and Beatrice Pearl Fuller, both of Muncy, Pa., assignors to Sprout, Waldron & Company, Inc., Muncy, Pa.

Filed July 17, 1974, Ser. No. 489,416
Int. Cl.[2] B02C *7/14*
U.S. Cl. 241—37 **13 Claims**



1. A disc type refiner comprising a base, a casing supported by said base, a drive shaft extending through said casing, means on said casing for rotatably supporting said drive shaft, a pair of stationary heads mounted within said casing in spaced opposed relation, a refining plate assembly radially disposed on each said stationary head, a pair of rotating heads mounted on said drive shaft, a refining plate assembly on each said rotating head in parallel juxtaposed relation to the refining plate assembly of the adjacent stationary head, means connecting said drive shaft and said rotating heads to provide rotation of said heads with said shaft while permitting axial movement thereof along said shaft, conveying means for directing stock to be refined into said casing between said juxtaposed refining plate assemblies, and means for adjusting the axial position of said rotating heads on said drive shaft, said latter means comprising cylinder-piston means on said shaft connected with each said rotating head, and a parallel hydraulic circuit operatively connecting said piston-cylinder means to equalize the positioning force on each said rotating head thereby permitting said rotating heads to float axially to balance the hydraulic cylinder-piston force against the axial force developed between the refining plate assemblies.

3,893,632

HAMMER MILL

Robert D. Helms, 73-845 Flagstone Ln., Palm Desert, Calif. 92260

Filed July 16, 1973, Ser. No. 379,581
Int. Cl. B02c *13/284*
U.S. Cl. 241—73 **4 Claims**

1. A hammer mill comprising:

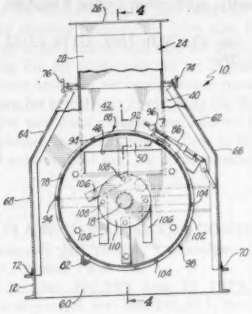
a housing having an inlet for coarse material to be comminuted, an outlet for fine comminuted material and a comminuting chamber between said inlet and outlet bounded by spaced end walls and intervening side walls of said chamber,

coaxial bearings on said end walls,

a shaft extending across said chamber and rotatably supported at opposite ends of said chamber in said bearings, a hammer assembly mounted on said shaft within said chamber for rotation with said shaft,

circular shoulders on the inner sides of said end walls in coaxial surrounding relation to said shaft,

a cylindrical comminuting screen assembly within said comminuting chamber coaxially enclosing said hammer assembly and having open ends surrounding and disposed in seating contact with said shoulders, said screen assembly comprising two semi-cylindrical screen sections having adjacent axially extending edges, hinge means joining said screen sections along two adjacent edges thereof, and means releasably joining said screen sections along their other adjacent edges, whereby said screen sections may be hingably separated for removal and replacement about said hammer assembly,



said housing having passage means communicating said inlet to the interior of said screen assembly and a comminuting chamber space about said screen assembly communicating with said outlet, and

at least one side wall including a wall element which may be removed to provide access to said comminuting chamber for removal and replacement of said screen assembly.

3,893,633

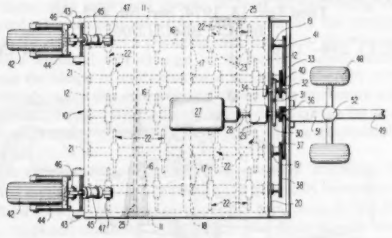
TREE THINNING AND REDUCING MACHINE

Ernest P. Cox, P.O. Box 154, Lolo, Mont. 59847

Filed Aug. 15, 1974, Ser. No. 497,668

Int. Cl.[2] B02C *13/09, 21/02*

U.S. Cl. 241—101.7 **10 Claims**



1. A tree thinning and wood reduction machine comprising a wheeled body portion adapted to travel through standing timber at an elevation close to ground level, plural spaced parallel longitudinal rotor shafts on said body portion and extending in the front-to-back direction thereon, plural toothed rotor heads on each rotor shaft turning therewith with the teeth of the rotor heads traveling close to the ground during turning and with the teeth turning in planes which are at right angles to the axes of the rotor shafts, said rotor heads on each shaft spaced apart axially thereon, and power means on the body portion coupled with the rotor shafts for turning the shafts in unison and in rotational directions causing said teeth to engage timber downed by the machine and to force the timber upwardly, and plural transversely extending front-to-back spaced breaker bars on said body portion substantially at right angles to said rotor shafts and crossing the latter and disposed between pairs of said rotor heads on said shafts and coacting with said teeth to reduce downed timber into roughly uniform relatively short lengths.

3,893,634

INNER LINING CONSTRUCTION FOR IMPACT CRUSHERS

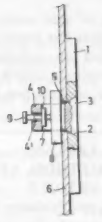
Horst Schmidt, Altenberger Dom 226, 5072 Schildgen, Germany

Filed Sept. 17, 1973, Ser. No. 397,886

Claims priority, application Germany, Sept. 15, 1972, 2246059

Int. Cl.[2] B02C *17/22*

U.S. Cl. 241—182 **5 Claims**



1. Armor structure for the housing of impact crushers, comprising a housing wall having inner and outer surfaces, means defining an opening through said housing wall, a plurality of armor plates, each of said armor plates comprising at least one recess, a pin including a wear-proof head extending through the wall opening with said head disposed in said recess, said pin further including a shaft extending through the wall opening, a transverse opening through said shaft, and means on the outer surface of said housing wall clampingly urging said pin outwardly of the housing, including a cross bar extending through the transverse opening through said shaft and spanning the housing wall opening, and a screw threadingly engaging said shaft for pressing said cross bar tightly against the outer surface of said housing wall.

3,893,635

SHREDDER STRUCTURE

John C. Brewer, Salt Lake City, Utah, assignor to Garbalizer Corporation of America, Salt Lake City, Utah

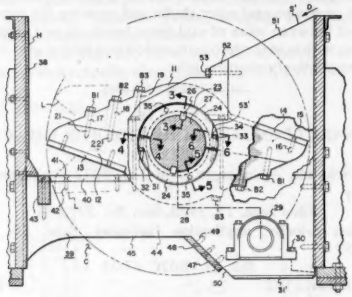
Continuation-in-part of Ser. No. 335,008, Feb. 23, 1973, Pat. No. 3,840,187. This application May 1, 1974, Ser. No. 465,898

Int. Cl.[2] B02C *18/06*

U.S. Cl. 241—243 **7 Claims**

1. A shredder construction including, in combination, a revolving shaft, a series of interspaced cutter blades having respective shearing portions and keyed to said shaft for revolvement therewith about the shaft's axis of revolvement, a series of mutually spaced, fixedly disposed cutter bars having opposite ends, said cutter bars having upper and lower edges and being cooperatively disposed in alignment between and positioned at least in part beneath the said axis of revolvement of said shaft, said cutter blades in their revolvement cyclically extending beneath said cutter bar lower edges, whereby debris as might tend to cling to said cutter blades will tend to be thrown off through centrifugal force, to deter re-entry of such debris upwardly between said cutter bars, said upper and lower edges of said cutter bars having respective shearing

portions respectively disposed cooperatively with said cutter blade shearing portions and positioned for mutual angular disposition with respect to said cutter blade shearing portions, in acute-angle fashion when said cutter blades are coacting with said shearing portions of said cutter bars at times of the



proximate shear-crossing of said cutter blade shearing portions with both of said cutter bar shearing portions of each of said cutter bars, to effect an angular, scissor-type shear, whereby to shear any remaining debris as might cling to said cutter blades as the same approaches said re-entry between said cutter bars.

3,893,636

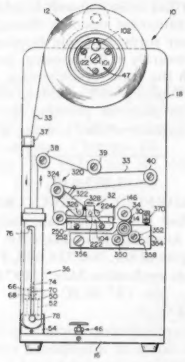
TAPE WRAPPING METHOD, APPARATUS, AND ARTICLE

Walter R. Wise, Pittsford, and Nicholas L. A. Martucci, Rochester, both of N.Y., assignors to Garlock Inc., Palmyra, N.Y.

Continuation-in-part of Ser. No. 224,520, Feb. 8, 1972, abandoned. This application Jan. 17, 1973, Ser. No. 322,289The portion of the term of this patent subsequent to Apr. 22, 1992, has been disclaimed.

Int. Cl. B65h *75/02*

U.S. Cl. 242—55 **43 Claims**



24. Apparatus for feeding tape from a tape roll to a workpiece to be wrapped with a length of the tape, said apparatus comprising:

a. a primary tape feed means for feeding tape to a workpiece; and

b. an air tape feed turbine for initiating rotation of said tape roll for feeding tape from said roll, said air impulse turbine including stationary air jet manifold, a turbine wheel rotatable with said tape roll and including a plurality of air fan blades, and also including means for generating an impulse force and a steady state force, said impulse force being sufficient to overcome tape feed resistance of said roll and initiate rotation thereof and said steady state force being less than said impulse force and also being less than the force necessary to produce sustained rotation of said tape roll whereby tape override is prevented.

3,893,637

RECORDING AND/OR PLAY BACK APPARATUS

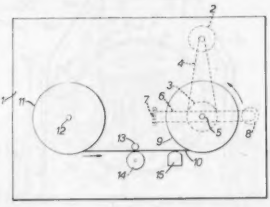
Vernon Seale-Finch, Woodcote, England, assignor to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Dec. 3, 1973, Ser. No. 421,186

Claims priority, application United Kingdom, Dec. 2, 1972, 55751/72

Int. Cl. G03b *1/04;* **G11b** *15/32*

U.S. Cl. 242—206 **1 Claim**



1. A method of magnetic tape recording and/or playback utilising apparatus comprising a feed spindle, a tape feed spool received upon the feed spindle, a tape take-up spindle, a tape take-up spool received upon the tape take-up spindle, drive means, a clutch through which torque is transmissable from the drive means to the tape take-up spindle, a capstan and pinch roller assembly, head means forming part of a magnetic head assembly and operable to provide the function of record/playback, the head means being positioned between the capstan and pinch roller assembly and the take-up spindle, the method comprising drawing tape from the said feed spool by means of the capstan and pinch roller assembly and further drawing by means of the tape take-up spool tape from the said capstan and pinch roller assembly across the said head means to effect the record and playback function.

3,893,638

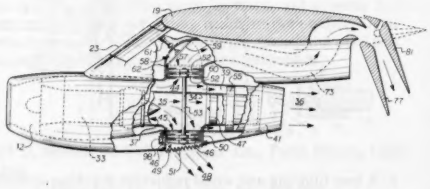
DUAL CYCLE FAN JET ENGINE FOR STOL AIRCRAFT WITH AUGMENTOR WINGS

George S. Kelley, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Feb. 14, 1974, Ser. No. 442,330

Int. Cl.² B64C *15/06*

U.S. Cl. 244—12 D **11 Claims**



5. In a STOL aircraft including ducted augmentor wings adapted to direct air energized by a jet engine to augmentor flaps, said augmentor flaps adapted to direct said air generally downwardly and, thereby, augment the lift provided by the aerodynamic shape of the wings of said STOL aircraft, the improvement comprising a dual cycle fan jet engine comprising:

a fan jet engine adapted to generate primary air and fan air; air driven means for extracting energy from air flow and generating power in accordance therewith, said air driven means having an inlet in communication with the primary air of said fan jet engine;

air compression means for compressing air, said air compression means connected to said air driven means so as to be powered by the power generated by said air driven means and said air compression means having an outlet in communication with the duct of one of said ducted augmentor wings of said STOL aircraft;

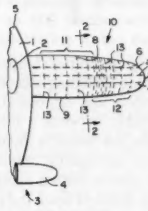
duct means, mounted between the rear of said fan jet engine, said air driven means and said air compression means, for ducting primary air from said fan jet engine between an axial exhaust and said air driven means, and for ducting fan air from said fan jet engine between an axial exhaust and said air compression means; and,

control means for selectively controlling the flow of primary air between said axial exhaust and said air driven means, and for selectively controlling the flow of fan air between said axial exhaust and said air compression means.

3,893,639
AIRPLANE WING CAMBER CONTROL

Thomas L. Croswell, Jr., Vienna, Va., assignor to Thomas L. Croswell, Jr., Baden, Pa.

Division of Ser. No. 390,399, Aug. 22, 1973, which is a continuation-in-part of Ser. No. 201,417, Nov. 23, 1971, abandoned. This application Sept. 25, 1974, Ser. No. 509,212
Int. Cl. B64c *3/44*
U.S. Cl. 244—44 **5 Claims**



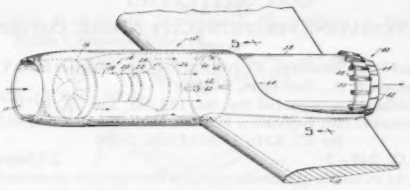
1. A fluid flow affecting generally planar member having opposed fluid flow surfaces on opposite sides of a geometric central plane, defining generally a leading edge and a trailing edge with respect to the relative flow direction; structural means maintaining said member in a particular geometric shape with a relatively fixed curvature for said central geometric plane; said structural means at least in part being constructed of a magnetostrictive material having the property that in the presence of a changing magnetic field the magnetostrictive material will change in shape to correspondingly change the shape of said structural means and thereby correspondingly warp the member and change the curvature of its geometric central plane; and electrical drive means for selectively impressing a magnetic field upon the magnetostrictive material.

4. A member for controlling the curvature of a fluid flow control member having a leading edge generally transverse to the fluid flow, a trailing edge generally transverse to the fluid flow, opposed surfaces over which the fluid flows, which surfaces are on opposite sides of a geometric central plane having a predetermined normal curvature, and structural means on opposite sides of said plane to maintain said control member in the predetermined curvature of said geometric central plane, comprising the steps of: orienting magnetostrictive material as an integral part of the structural means so that with a magnetic field applied to the magnetostrictive material, it will change in length to correspondingly change the effective length of the structural means and warp the control member as defined by a change in curvature of the geometric central plane; and selectively applying a magnetic field to the magnetostrictive material in an amount and of a characteristic to provide a desired curvature of the control member.

3,893,640
SOUND SUPPRESSING NACELLE ARRANGEMENT

Thomas Neil Hull, Jr., Marblehead, and Denis Pierpont Edkins, Lynnfield, both of Mass., assignors to General Electric Company, Lynn, Mass.

Filed Nov. 27, 1973, Ser. No. 419,264
Int. Cl. B64d *27/00*
U.S. Cl. 244—54 **7 Claims**



1. A sound suppressing nacelle arrangement housing a gas turbine engine for propulsion of a winged aircraft comprises: a nacelle mounted over the wing of the aircraft with an opening at the upstream end thereof for receipt of an inlet airflow to the gas turbine engine, said wing including a trough-like surface;

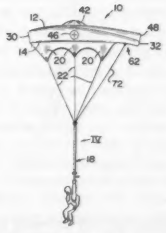
an exhaust duct translatably disposed in serial flow relation downstream of the nacelle for telescoping engagement within the nacelle,

and means for translating the exhaust duct forwardly over the wing to expose rearwardly of the exhaust duct a portion of the nacelle overlying said trough-like surface of the wing, said trough-like surface operating as a sound reflecting shield when said exhaust duct is in its forward position.

3,893,641
FLOW FORM DEVICE

Stephen John Sutton, 16 Edgevalley Dr., Islington, Ontario, Canada

Filed Apr. 18, 1974, Ser. No. 462,027
Int. Cl. B64d *17/18*
U.S. Cl. 244—145 **36 Claims**



1. A flow form device of the type used primarily to maintain both vertical and horizontal stability and maneuverability in a predetermined fluid environment, said device comprising: a first skin means of predetermined configuration; a second skin means of predetermined configuration disposed in substantially spaced apart relation from said first skin means; a plurality of third skin means disposed in interconnecting relation between said first and second skin means; at least one spor means defined by said first, second and third skin means, one end of said spor means at least partially defining a leading edge of said device, at least a portion of said spor means being

closed at its opposite end to at least partially define the trailing edge of said device; a plurality of first Jordan clusters formed in said first skin means; a plurality of second Jordan clusters formed in said second skin means; a plurality of holonomic ports formed in said third skin means; a jet port means defined by at least a portion of said one spor means being open at its aft end; a jiro port means formed in said second skin means; and control means operatively connected with said second skin means, whereby the passage of said device through a predetermined fluid environment may be controlled with respect to both horizontal and vertical planes.

3,893,642

POLYETHYLENE TEREPHTHALATE PLASTIC COATED WIRE

Robert Van Vlaenderen, Zwevegem, Belgium, assignor to N. V. Bekaert S. A., Zwevegem, Belgium

Continuation-in-part of Ser. No. 108,355, Jan. 21, 1971, abandoned. This application Feb. 28, 1973, Ser. No. 336,469

Int. Cl. B21b *25/00, 27/00, 29/00*

U.S. Cl. 245—2 **2 Claims**

1. As an article of manufacturing, a mechanically processed wire product comprising barbed wire, wire fence, wire mesh, wire netting or the like, manufactured from a steel wire coated with a coating of polyethylene terephthalate wherein said polyethylene terephthalate coating is at least 95% amorphous and has a thickness ranging from about 0.1 to 0.3 mm. and wherein said steel wire has a diameter greater than about 1 mm.

3,893,643

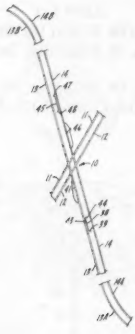
SHOCK-PROTECTED RAILWAY CROSSING

Earl E. Frank, Tallman, N.Y., assignor to Abex Corporation, New York, N.Y.

Filed Jan. 30, 1974, Ser. No. 437,802

Int. Cl. E01b *7/18*

U.S. Cl. 246—465 **2 Claims**



1. A shock-protected railway crossing comprising:

first and second pairs of parallel traffic rails crossing each other at a crossing intersection;

crossing guards positioned adjacent the crossing segments of the traffic rails respectively and each crossing guard being adapted to guide a railway wheel along its associated traffic rail through the intersection;

and an elongated guide rail located upstream of said crossing and positioned parallel to and on the gauge side of one of the traffic rails, said guide rail being spaced from the outer end of the related crossing and crossing guard by one to three standard lengths of traffic rail for engaging and straightening any skewed wheel before that wheel reaches the related crossing guard;

the outer end of the guide rail having an elongated flare to minimize the shock of engagement of a skewed wheel with said guide rail; and

said one traffic rail between the guide rail and the crossing and crossing guard being firmly boxed by said anchor means on both sides to the base on which said one traffic rail is supported so that the force applied to the guide rail and said one traffic rail in straightening a skewed wheel is transferred to the base and does not distort the angle of intersection of the paired traffic rails.

3,893,644

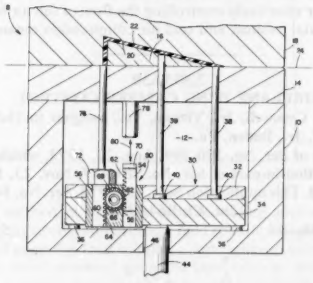
EJECTOR ACCELERATOR FOR MOLDING APPARATUS

Herman J. Drazick, 3558 Darcy, Birmingham, Mich. 48010

Filed Aug. 6, 1973, Ser. No. 386,188

Int. Cl. B28b *7/10*

U.S. Cl. 249—68 **19 Claims**



1. Injection molding apparatus comprising:

a movable mold plate including a core upon which molded articles are formed and deposited, the movable mold plate being movable between a molding position and a retracted position, the movable mold plate further including an ejector box and ejector means disposed within the ejector box, the ejector means being movable relative to the mold plate to impinge upon the core during motion of the mold plate from the molding position to the retracted position, for ejecting molded articles disposed on the core, and an actuating member on said movable mold plate; and

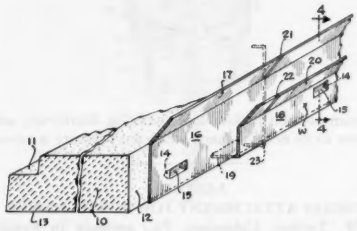
ejector accelerator means for varying the relative velocity of the ejector means during at least a portion of the motion of the movable mold plate to the retracted position, the ejector accelerator means including a housing with means forming first and second elongated slots in said housing, a first non-rotatable and longitudinally movable element in said first slot for engaging the actuating member on said movable mold plate during retractive motion thereof thereby urging the first movable element away from the core, a second non-rotatable and longitudinally movable element in said second slot movable toward the core when the first movable element moves away from said core and engaging the ejector means, a coupling element coupling the first movable element to the second movable element so that the latter element moves in response to motion of the former element, and spring return means operatively connected to said coupling means for biasing said first movable element toward the core and the second movable element away from the core when the first movable element is no longer in engagement with the actuating member, said first and second movable elements moving toward and away from the core through movement of said mold plate and engagement of said first movable element with said actuating member during said retractive motion and through the action of said spring return means without any external drive means so that the first and second movable elements

move primarily in response to movement of said mold plate and through action of said spring return means.

3,893,645
REFRACTORY BOTTOM RING WITH TWO FLEXIBLE WIPER ELEMENTS

Ervin A. Marcec, 4800 Chicago Beach Dr., Chicago, Ill. 60615

Division of Ser. No. 297,719, Oct. 16, 1972, Pat. No. 3,758,942, which is a continuation-in-part of Ser. No. 64,162, Aug. 17, 1970, abandoned. This application June 25, 1973, Ser. No. 372,952
Int. Cl. B22d *7/10*
U.S. Cl. 249—202 **2 Claims**

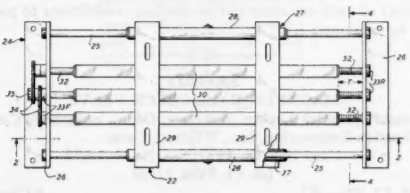


1. A preassembled bottom ring for a conventional nondisposable steel hot top comprising a refractory bottom member or ring having a central opening defined at least in part by a bottom surface, and a plurality of outer and inner surfaces substantially normal to said bottom surface, the said outer surfaces generally conforming to the outer configuration of the lower end of the hot top from which said ring is adapted to be suspended, and means disposed about said outer surfaces of said ring including two complete sets of flexible wiper elements spaced one above the other extending outwardly and upwardly about the entire periphery of the refractory bottom member, adapted and arranged to protect the hot top casing from damage and prevent leakage of hot metal from the mold, said means comprising two sheet metal pieces per outer surface preformed to matingly engage in partially overlapping juxtaposition the outer surface and bottom surface of said refractory bottom member, each said two pieces per side being joined together and said joined pieces being joined one to another at each corner of the ring.

3,893,646
OSCILLATION ABSORBING MOTOR BASE

Jerome J. Sloyan, c/o Automatic Motor Base Co., Windsor, N.J. 08561

Filed Mar. 27, 1974, Ser. No. 455,366
Int. Cl.² F16M *3/00*
U.S. Cl. 248—23 **5 Claims**

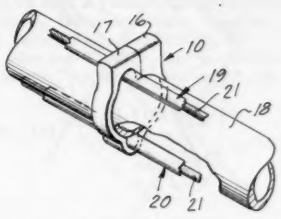


1. A motor base for absorbing equipment oscillations, comprising a basal body portion capable of being secured in a fixed position and having parallel rails extending from front to rear thereof, a carriage slidably mounted on said rails adapted to be moved forwardly and rearwardly a limited distance commensurate with the normal belt-tightening function of the spring and with the imposed oscillations, and a spring positioned and retained continuously under pressure providing a forwardly acting work stroke urging said carriage in a forward direction throughout said limited distance, said spring having a compressability range in excess of its said work stroke and in excess of said limited distance of movement of the carriage, thereby restricting the used spring pressure to initial low-pressure range of the spring compression without involving use of maximum high pressure range of compression of said spring.

3,893,647
CYCLE FRAME CLAMP

James D. Kennedy, Streamwood, Ill., assignor to Beatrice Foods Company, Elgin, Ill.

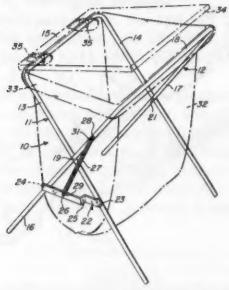
Filed June 6, 1973, Ser. No. 367,416
Int. Cl.² F16L *3/00*
U.S. Cl. 248—68 R **1 Claim**



1. A one-piece, self-locking clamp of resilient, flexible plastic, said clamp being adapted to extend circumferentially about a cycle frame member and being further adapted to hold a pair of cable-like members which longitudinally extend along a bicycle frame member in circumferentially spaced relationship without exerting any substantial radial compressive force upon either one of such cable-like members, said clamp comprising: a centrally disposed, elongated mid-section having a front face and a back face and whose facial width is generally substantially greater than the thickness thereof, said mid-section being interrupted at a generally central location by having integrally, permanently formed therein a cross-sectionally U-shaped projection extending transversely across said mid-section outwardly from said front face and inwardly from said back face whose inside width and inside height are adapted to accommodate therewithin a single, prechosen one of said cable-like members, a first thickened portion integrally formed at one end of said mid-section having a socket defined therein, a second thickened portion integrally formed at the opposite end of said mid-section having defined permanently therein a cross-sectionally generally U-shaped channel which extends transversely across said mid-section outwardly from said front face and inwardly from said back face and whose inside width and inside height are adapted to accommodate therewithin a single prechosen one of said cable-like members, said channel being in longitudinally spaced, parallel relationship to said U-shaped projection, an integrally formed prong projecting from said second thickened portion and adapted to make mating engagement with said socket, said prong having serrated outer side wall portions, which serrated portions are adapted to make yielding, biased engagement with inside wall portions of said socket, thereby adapting said prong to interlock with said socket when so engaged therewith, wherein the axis of said socket is generally normally inclined relative to said mid-section and said socket generally upstands relative to said back face in the region of said first thickened portion when said clamp is assembled, wherein the axis of said prong is generally normally inclined relative to said mid-section and said prong generally upstands relative to said back face in the region of said second thickened portion when said clamp is assembled, and wherein behind said socket and behind said prong, and integrally formed one in each of said

first and second thickened portions, respectively, shoulders are provided each of which is adapted as a base against which pressure may be manually applied to engage said socket with said prong.

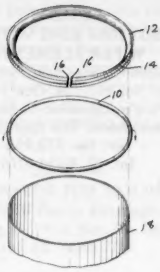
3,893,648
BAG HOLDER
Robert B. Gilbert, New Lebanon, Ohio, assignor to TDC Inc., Dayton, Ohio
Filed Nov. 15, 1973, Ser. No. 415,968
Int. Cl. B65b *67/12*
U.S. Cl. 248—97 **16 Claims**



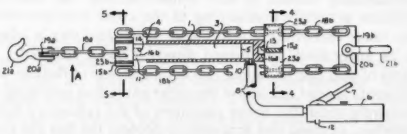
1. A bag holding device including a frame to mount a bag-like element in an opened condition and in a selected attitude of suspension, said frame including leg portions having means defining a point of their interconnection for pivoting of one relative another and adjustment thereof between open and collapsed positions, means for limiting said leg portions in their movement toward an open position, and an over-center spring device attached at one end to one of said leg portions and at the other end to said limiting means and shifting from side to side of said point of interconnection in response to opening and collapsing movements of said leg portions to apply alternatively a yielding pressure to hold said leg portions in an open position and a yielding pressure to hold said leg portions in a collapsed position.

3,893,649
BAG HOLDER
Robert J. Cornell, Watchung, and Louis Vitale, Mountainside, both of N.J., assignors to Dynamic Form Systems, Inc., Scotch Plains, N.J.
Filed Aug. 9, 1971, Ser. No. 170,099
Int. Cl. B65b *67/12*
U.S. Cl. 248—99 **1 Claim**

1. A bag holder to spread the mouth of a bag, comprising a freely movable basic ring into which the mouth of a bag is inserted and folded over with a return flap; and
- a freely movable supplemental retainer ring having a circumferential groove receiving said frame ring with said bag mouth therebetween;
- said basic frame ring comprising a hollow tube of plastic with the ends secured together;
- said retainer ring comprising a length of plastic extruded into U-shaped cross section which faces perpendicularly outward from the common axis so as to engage the inside of the hollow tube;
- the wall thickness of said U-shaped retainer ring being substantially equal to that of said plastic hollow tube, and the resilience thereof, enabling the bag with its holder to be pressed down onto the ground so as to flatten the bottom portion to facilitate sweeping thereover, and to return to its normal shape when the pressure is released.



3,893,650
TENSION ATTACHMENT FOR PORTO POWER
Frank W. Turben, Columbus, Pa., assignor to Frank D. Turben, Columbus, Pa.
Filed June 17, 1974, Ser. No. 480,008
Int. Cl. B66f *3/24*
U.S. Cl. 254—93 R **1 Claim**



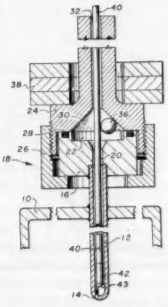
1. A unitary attachment for a porto power ram having spaced compression thrust exerting surfaces movable apart along an axis by hydraulic pressure and movable toward each other when the hydraulic pressure is relieved, first and second substantially identical closed loops extending along said axis with adjacent ends of the loops linked together to sustain axial tension, the plane of the first loop being transverse to the plane of the second loop, each loop having a pair of axially extending link chains spaced on opposite sides of said axis and having one end fixed to a crosshead in the plane of the loop and the other end fixed to an equalizer bar in the plane of the loop, the adjacent ends of the loops being the crossheads and the remote ends of the ends of the loops being the equalizer bars, said crossheads being in compression thrust relation to said thrust surfaces so that when said crossheads are pushed apart the equalizer bars are pulled together, and a hook at the center of each equalizer bar for making connections to parts to be tensioned.

3,893,651
MAGNETIC BALL CHECK VALVE
Donald Frederick Uecker, Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.
Filed May 18, 1973, Ser. No. 361,672
Int. Cl. F16k *31/44*
U.S. Cl. 251—82 **5 Claims**

1. A magnetic ball check valve comprising:
- a valve body,
- a conically shaped chamber in said valve body,
- a first channel communicating with the base of said conically shaped chamber and extending through said valve body to the surface thereof,

a second channel communicating with the apex of said conically shaped chamber and extending through said valve body to the surface thereof,

a ball contained in the conically shaped chamber, said ball being larger in diameter than the diameter of said first and said second channels and said ball and said chamber being sized such that said ball may be displaced in said chamber from said apex by means so as to provide a clear



straight path through said chamber from said first channel to said second channel, and

a magnet attached to said valve body, said magnet being located proximate to the apex of said conically shaped chamber and of sufficient strength so as to be adapted to attract said ball to said apex from anywhere in said chamber to close off and prevent flow from said chamber into said second channel.

3,893,652

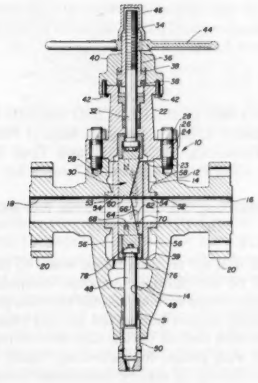
MEANS CONNECTING GATE VALVE AND VALVE STEM

Paul J. Natho, Houston, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 404,066, Oct. 5, 1973, abandoned. This application July 15, 1974, Ser. No. 488,647

Int. Cl.[2] F16K *25/00*

U.S. Cl. 251—84 **8 Claims**



1. A gate valve structure comprising a valve body having a valve chamber therein and inlet and outlet flow passages communicating with the valve chamber, a gate member slideably mounted within the valve chamber for movement between open and closed positions of the gate valve structure, a threaded extension on an end of the gate member, a stem at the end of said gate member adjacent said threaded extension and having an enlarged annular shoulder adjacent said gate member, a nut having a central opening receiving said stem and an annular abutment adjacent said central opening engaging said annular shoulder in abutting relation to retain the stem, said nut being threaded onto said extension and thereby connecting said stem and gate member, said gate member adjacent said threaded extension having at least one outwardly biased plunger thereon, said plunger having a portion thereof extending laterally outwardly beyond the outer peripheral surface of the end of said nut, and a plurality of recessed portions spaced along the circumferential end surface of said nut adapted to selectively receive the plunger therein to restrain the nut against rotation and position the nut relative to said threaded extension.

3,893,653

VALVE FOR A PRESSURIZED DISPENSER

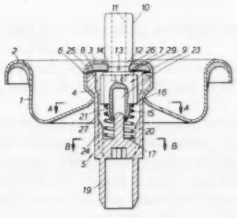
Günter Kolanus, Hattersheim/Main, Germany, assignor to Precision Valve Corporation, Yonkers, N.Y.

Filed July 17, 1973, Ser. No. 380,003

Claims priority, application Germany, July 22, 1972, 2236068

Int. Cl. F16k *31/00*

U.S. Cl. 251—353 **3 Claims**



1. A dispensing valve for a pressurized dispenser comprising: a valve housing, a valve body movable axially within the housing, said valve body including an integral hollow valve stem extending axially upwardly and an integral hollow spring retaining sleeve extending downwardly, a valve port in the valve stem communicating with the interior of the valve stem, an annular gasket encompassing and sealing the valve port when the valve body is in a raised position, a helical compression spring which biases the valve body upwardly, the upper portion of said spring overlying and being retained on said spring retaining sleeve, the lower portion of said spring being disposed on a spring supporting surface on the interior bottom of the valve housing, and a guide pin extending axially upwardly from the interior bottom of said valve housing through the interior of said spring and telescopically received in the interior of said spring retaining sleeve.

3,893,654

MIXING APPARATUS

Harunobu Miura, 8-40 Kumoi-cho, Nishinomiya-shi, Hyogo-ken, and Kenji Asano, Murakami Sue 2137-2 1-chome Hakozaki, Maekawacho, Fukuokashi, both of Japan

Filed Mar. 16, 1973, Ser. No. 342,032

Claims priority, application Japan, Mar. 18, 1972, 47-027558

Int. Cl.[2] B01F *15/02*

U.S. Cl. 259—4 **4 Claims**

1. A mixing apparatus for mixing a substance comprising: an elongated hollow conduit having a substantially rectangular cross section, and having four sides each of said four sides having a substantially flat inner surface;

a plurality of mixing elements contained within said hollow conduit, each mixing element comprising:

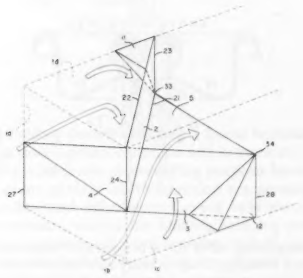
first and second rectangular members, disposed on a common transverse axis and having first and second longitudinal edges and first and second lateral edges,

first and second generally triangular members each leading normal to said first and second rectangular members,

said first generally triangular member leading from one half of said first longitudinal edge of said first rectangular member and having one edge thereof abutting one half of said first longitudinal edge of said second rectangular member, and

said second generally triangular member leading from the other half of said first longitudinal edge of said second rectangular member, and having one edge thereof abutting the other half of said first longitudinal edge of said first rectangular member;

said mixing elements being placed in said hollow conduit, such that, said second longitudinal edge of said first rectangular member abuts said flat inner surface of one of said sides of said conduit, and said first lateral edge of said first rectangular member abuts said flat inner surface of one of the sides adjacent said one of said sides and said second lateral edge of said first rectangular member abuts said flat inner surface of the other of said sides adjacent said one of said sides, and said second longitudinal edge of said second rectangular member abuts said flat inner



surface of the side opposite said one of said sides, and said first lateral edge of said second rectangular member abuts said flat inner surface of said one side adjacent said one of said sides and said second lateral edge of said second rectangular member abuts said flat inner surface of the other of said sides adjacent said one of said sides;

a first quasi-conical body having an apex substantially coinciding with the end, away from said transverse axis, of said one half of said first longitudinal edge of said first rectangular member, said quasi-conical member being disposed on the opposite side of said first rectangular member from said first triangular member, and abutting said flat inner surface of said one of said sides of said conduit and also abutting said flat inner surface of said one side adjacent said one of said sides;

a second quasi-conical body having an apex substantially coinciding with the end, away from said transverse axis, of said other half of said first longitudinal edge of said second triangular member, said quasi-conical member being disposed on the same side of said second rectangular member as said second triangular member, and abutting said flat inner surface of the side opposite said one of said sides and also abutting said flat inner surface of said other of said sides adjacent said one of said sides; and

said quasi-conical bodies acting to prevent viscosity resistance which would normally be generated in the space occupied by said quasi-conical bodies thereby aiding the substance to smoothly flow through said conduit.

3,893,655

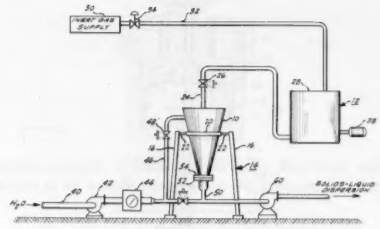
APPARATUS AND METHOD FOR DISPERSING SOLID PARTICLES IN A LIQUID

Burton B. Sandiford, Placentia, Calif., assignor to Union Oil Company of California, Brea, Calif.

Continuation-in-part of Ser. No. 270,495, July 10, 1972, Pat. No. 3,782,695. This application Aug. 9, 1973, Ser. No. 387,176

Int. Cl. B01f *15/02*

U.S. Cl. 259—4 **15 Claims**



1. A solids-liquid mixing apparatus for dispersing a particulate solid material in a liquid, which comprises:

a wetted wall funnel having a throat of reduced cross-section;

a solids container;

frame means for supporting said wetted wall funnel in a substantially vertical position with said throat at the bottom;

solids conduit means communicating said solids container and said wetted wall funnel for conducting particulate solid material from said solids container to said wetted wall funnel;

liquid distributor means for flowing liquid substantially uniformly over the interior surface of said wetted wall funnel;

liquid conduit means attached to and communicating with the throat of said wetted wall funnel for flowing liquid past the throat of said funnel; and

a pump installed in said liquid conduit means downstream of said wetted wall funnel, said pump having a volumetric capacity exceeding the combined volumetric liquid supply rate to said apparatus whereby a vacuum is induced in said liquid conduit means adjacent to the throat of said wetted wall funnel.

3,893,656

MOBILE UNIT FOR TREATING LIQUID WASTE

Donald J. Opacic; Arpad L. Lengyel, both of Pittsburgh; Edward A. Zawadzki, McMurray, and Fred H. Jackson, Bridgeville, all of Pa., assignors to Chemfix Inc., Pittsburgh, Pa.

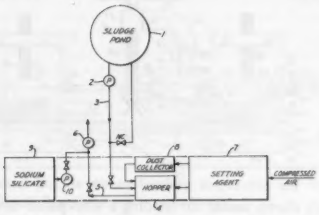
Filed Aug. 20, 1973, Ser. No. 389,565

Int. Cl.[2] B01F *5/00, 7/16*

U.S. Cl. 259—7 **9 Claims**

1. A mobile unit for treating liquid waste to render it nonpolluting and fit for ultimate disposal, comprising a truck trailer chassis provided with wheels for transportation over the ground, a mixing hopper supported by said chassis and provided with an inlet and an outlet, said inlet being adapted to be connected with means for delivering liquid waste to the hopper from a source of supply, said outlet being adapted to be connected to conduit means extending from the hopper to a disposal area, a substantially rectangular bin for a powdered silicate setting agent mounted on said chassis and having an outlet at its bottom, upright partition walls in said bin mounted on its bottom to form a plurality of chambers, substantially flat porous members covering said chambers to form a porous floor in the bin spaced above its bottom and sloping toward

said bin outlet, a source of compressed air, pipe means connecting said source with each of said chambers for delivering compressed air to the space in the bin beneath its porous floor to form a fluidized bed of setting agent above said floor, valves in said pipe means for controlling flow of air therethrough to the different chambers independently of one another, said pipe means and said valves being constructed and arranged to



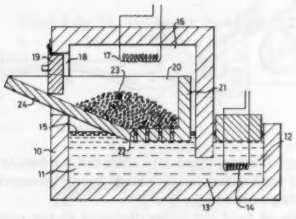
control the bulk density of the setting agent in said bin and prevent dead-spots therein, means for delivering setting agent from said bin outlet to said hopper, means in the hopper for mixing setting agent with liquid waste therein, a tank for liquid alkali metal silicate mounted on said chassis and having an outlet, and a conduit connected to said tank outlet for delivering silicate to the hopper mixture.

3,893,657

METHOD FOR SEPARATING METAL WHICH ACCOMPANIES SLAG SKIMMED FROM A BATH OF MOLTEN METAL, AND A DEVICE FOR CARRYING OUT THE METHOD

Sven Ivar Sieurin, Upplands Vasby, Sweden, assignor to Granges Essem Aktiebolag, Vasteras, Sweden

Filed May 31, 1973, Ser. No. 365,744
Claims priority, application Sweden, June 5, 1972, 7371/72
Int. Cl.[2] C21C *21/00*
U.S. Cl. 266—37 **3 Claims**



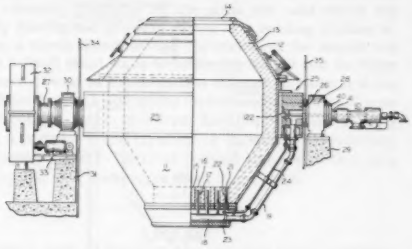
1. An apparatus for recovering metal from slag skimmed from the surface of a mass of molten metal, comprising a heat-insulated furnace, a basin in the bottom region of said furnace, capable of holding the mass of molten metal up to a desired level therein; said furnace defining therein a space containing an atmosphere above said basin; an opening provided through a wall of said furnace; closure means for said opening, for shielding the atmosphere in said space from the ambient atmosphere; a container placed in said space for receiving and collecting a batch of the skimmed slag entering through said opening; the bottom wall of said container having therein a number of through apertures, for leading the metal, recovered from the slag, in the molten state down into the mass of molten metal, while retaining a residual portion of the slag in said container; heating means in said space for keeping the atmosphere therein at a suitable temperature, for melting the metal contents out of the slag in said container, to flow through said apertures; and means for leading the molten metal away from said basin.

3,893,658

MULTIPLE GAS FEED ROTARY JOINT FOR METALLURGICAL VESSELS

Howard M. Fisher, New Castle, Pa., assignor to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 213,386, Dec. 29, 1971, abandoned. This application Feb. 15, 1973, Ser. No. 332,650
Int. Cl. C21c *5/46*
U.S. Cl. 266—36 P **35 Claims**



1. A rotary joint for conducting multiple fluids to a metallurgical vessel and the like, comprising:

a. tubular means adapted to connect to a rotatable vessel for delivering a first fluid to the interior of the vessel in one path,

b. swivel joint means coupled with said tubular means, said swivel joint means being constructed and arranged for being connected with a first source of fluid and for permitting said tubular means to turn with said vessel,

c. hollow means through which said tubular means extends, said hollow means providing in cooperation with the outside of said tubular means a passage for delivering a second fluid to a vessel along another path, said hollow means having an inlet for said second fluid,

d. means effecting a rotational seal joint between said hollow means and said vessel for permitting said vessel to rotate while said hollow means remains stationary,

e. chamber means through which said tubular means extends from said hollow means,

f. rotational seal means constructed and arranged to prevent gaseous fluid from leaking from said hollow means to said chamber means and to permit said tubular means to rotate with said vessel in respect to said hollow means and said chamber means, and

g. means adapted to sense gas in said chamber means which gas may be present as a result of leakage from said hollow means.

3,893,659

PRECIPITATOR FOR REMOVING COPPER FROM SOLUTION USING IRON MINI-PELLETS

Kris S. Krish, Gibsonia, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

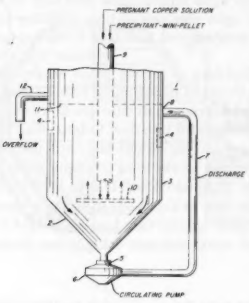
Division of Ser. No. 286,451, Sept. 5, 1972, Pat. No. 3,841,865. This application May 29, 1974, Ser. No. 474,243
Int. Cl.[2] C22B *3/02, 15/12*
U.S. Cl. 266—22 **6 Claims**

1. An apparatus for precipitating copper from pregnant solution onto iron precipitant-mini-pellets and dislodging the precipitated copper therefrom, and for removing the copper from the solution comprising:

a treatment vessel of generally conical formation having an apex directed downwardly and an open base facing upwardly, a vertically disposed inflow pipe centrally dis-

posed relative to the vessel, which inflow pipe ends proximate the top of the inverted cone formation, for continuously introducing into the treatment vessel at its open end pregnant solution and iron pellets;

a diffuser plate placed a short distance immediately below and transverse to the axis of the inflow pipe, with the inflowing mixture being directed against the diffuser plate, to dynamically suspended the inflowing mixture whereby the copper precipitates on the iron pellets and is thereafter dislodged therefrom;



a circulating pump at the lower apex of said vessel, the pumping rate of which exceeds the rate of the new inflowing solution, for constantly drawing off a portion of the mixture of precipitant-mini-pellets and pregnant solution; conduit means connected to said circulating for constantly returning the drawn off mixture tangentially to the upper part of the treatment vessel as a circulating stream; means for allowing spent solution and precipitated copper to escape from the upper part of the treatment vessel, said escape means being a screen means with openings of a size which allows the particulate copper and not the iron pellets to escape the treatment vessel; and,

an overflow tube located above said screen means.

3,893,660

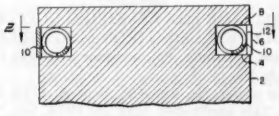
PISTON RING EXPANDER SPRING

E. Crosby Bush, Corry, Pa., assignor to Associated Spring Corporation, Bristol, Conn.

Filed Nov. 28, 1973, Ser. No. 419,628

Int. Cl. F16f *1/34*

U.S. Cl. 267—1.5 **2 Claims**



1. A helical spring constructed and adapted to be positioned in the ring groove of a piston behind the piston ring with the outer surface of each of its coils in engagement with the inner surface of the piston ring, in which the outer surface of each coil of the spring has a curvature circumferentially of the annular spring which corresponds to the circumferential curvature of the inner surface of the piston ring.

3,893,661

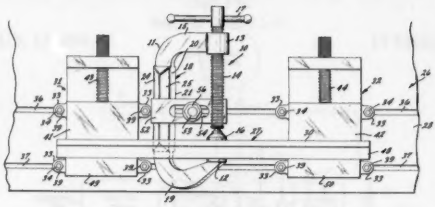
C CLAMP STRUCTURE

Lorin B. Brown, 1501 S. Manhattan Pl., Los Angeles, Calif. 90019

Filed Apr. 1, 1974, Ser. No. 456,834

Int. Cl. B23q *3/04*

U.S. Cl. 269—97 **4 Claims**



1. A clamp useful for holding a workpiece down on a support, comprising: a substantially C shaped frame having a straight bight portion; a pair of opposing coacting jaws provided on the ends of said frame; said bight portion being elongated and enlarged with a hexagonal cross section to thereby provide substantially long, wide, flat surfaces about the bight portion with pairs of opposite, flat surfaces being parallel to each other; and means including a flat, engaging surface for securing the frame of said clamp to said support by having a flat surface of said bight portion bearing against a flat surface of said support while said flat surface on said means engages the spaced, opposite, parallel, flat surface on said bight portion.

3,893,662

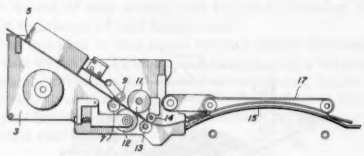
SHEET FEEDING DEVICE

Kenneth M. Boyd, Ross-on-Wye, England, assignor to Rank Xerox, Ltd., London, England

Filed Dec. 11, 1973, Ser. No. 423,830

Int. Cl. B65h *9/00*

U.S. Cl. 271—10 **4 Claims**



1. A sheet feeding apparatus adapted for sequentially receiving and forwarding single sheets being transported along a sheet path comprising:

a plurality of feed roll pairs disposed in the path of sheet travel for contact with the lead edge of the sheet at opposite sides thereof, each roll pair having a first roll formed of a substantialy non-deformable material, each of said roll pairs having a second roll formed of a deformable material, the rolls of each roll pair being adjustable relative to each other to vary the deformation of the deformable roll, thereby increasing the length of the sheet path therethrough to correct skew of the sheet passing therebetween.

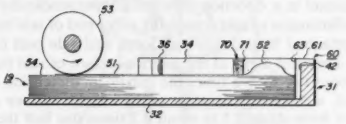
4. A method of correcting skew in a sheet being forwarded along a sheet feed path wherein one side of the lead edge of the sheet is in advance of the other side of the lead edge of the sheet including the steps of passing the side of the sheet in advance of the other side of the sheet through a first path having a predetermined length; and,

passing the other side of the sheet through a path having a predetermined length less than the predetermined length of said first path.

3,893,663
REVERSE BUCKLE SHEET FEEDING APPARATUS

Hector J. Sanchez, Webster, and Donald W. Tates, Fairport, both of N.J., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 352,131, April 18, 1973, abandoned.
This application Jan. 16, 1974, Ser. No. 433,623
Int. Cl. B65h *3/56*
U.S. Cl. 271—21 23 Claims



1. A reverse buckle sheet feeding apparatus for feeding individual sheets from a stack comprising:

means for supporting said stack, said stack having a plurality of individual sheets, each of said sheets having side edges in opposing relationship, a leading edge and a trailing edge;

feeding means adapted to contact the top sheet of said stack for advancing it first rearwardly to form a buckle and then forwardly to feed said top sheet from said stack; and

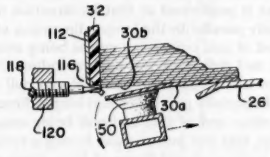
means for constraining said buckle for limiting the size of said buckle, said constraining means being located between said feeding means and the trailing edge of said top sheet, said constraining means being adapted to contact said opposed side edges of said sheets of said stack, said constraining means permitting substantially free movement of said top sheet in the forwardly and rearwardly feeding directions;

whereby said buckle forms between said constraining means and the trailing edge of said top sheet during feeding, and the size of said buckle is reduced as compared to an unconstrained buckle.

3,893,664
STOCK FEEDER FOR PRINTING PRESS

Elmer R. Thomsen, 1021 N.E. 135th Ave., Portland, Oreg. 97230

Filed July 20, 1973, Ser. No. 381,352
Int. Cl.[2] B65H *3/08*
U.S. Cl. 271—100 8 Claims

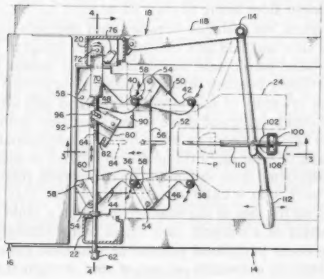


1. A feeder for flexible sheet material comprising: a hopper means for receiving and supporting a plurality of flexible sheets in a stack; a vacuum gripping means movably disposed under said stack and adapted to engage a marginal edge portion of the lowermost sheet in the stack; means for initially moving said gripping means in a twisting motion while it is engaged with the lowermost sheet so as to twist the engaged sheet off of the stack and thereby separate such sheet from the next uppermost sheet in the stack and consequently break the vacuum between such sheets; means after cessation of the operation of the foregoing means and consequent completion of the twisting action for moving said gripping means downwardly away from the stack with the sheet held thereby and thus lowering the sheet from the stack; means for engaging the edge portion of the next lowermost sheet in the stack and thus assisting in the separation of the sheets and also retaining the stack properly within the hopper means as the engaged sheet is lowered from the stack; a conveying means to which the sheet is delivered by the gripping means for conveying the sheet from the feeder; means for returning the gripping means upwardly back into engagement with the next lowermost sheet in the stack, said gripping means including a sucker rod constituting a manifold and having a plurality of suction cups constituting suckers mounted therein in communication therewith; means connecting the sucker rod to a vacuum source; said means for moving the gripping means downwardly from the stack including a pair of arms mounted for vertical swinging movement, and a rod supporting and actuating said arms and said sucker rod being carried by the arms, said sucker rod being rotatably journaled in the arms and said means for initially moving the gripping means in a twisting motion including a constraining linkage connected to the sucker rod and to a fixed point so as to cause the sucker rod to rotate counterclockwise as the arms first attempt to move it down away from the stack and spring means connected to said arms to prevent the sucker rod from lowering until the twisting action is completed and constituting the means for returning the gripping means to its raised position with the suction cups engaging the next lower most sheet in the stack.

3,893,665
JOGGING AND ALIGNING APPARATUS FOR SORTING AND COLLATING DEVICE

Ronald W. Greene, Seattle, Wash., assignor to EMF Corporation, Seattle, Wash.

Filed Nov. 26, 1973, Ser. No. 419,032
Int. Cl. B65h *31/38*
U.S. Cl. 271—221 11 Claims



1. A sheet stack jogging and aligning mechanism for collator/sorter devices having a vertical stack of copy receiving bins, comprising:

a. at least one generally vertically extending jogger bar on each side of said stack of bins, said jogger bars being attached top and bottom to pivotal support arms attached to said collator/sorter device,

b. the bottom support arms comprising linkage arms for arcuately swinging said jogger bars inwardly and outwardly,

c. said linkage arms being pivotally secured to a stationary plate below said stack of bins and detachably secured to a slide means located above said stationary plate so that by movement of said slide means said linkage arms may be swung outwardly or inwardly according to the direction of movement of said slide means,

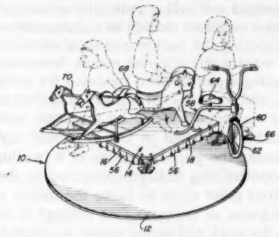
d. adjustable backstop means for engaging the leading edge of a sheet of paper when it enters a bin, and

e. actuator-adjustor means for moving said slide means.

3,893,666
OCCUPANT PROPELLED ROUNDABOUT

Joseph L. Parsons, Star-Rt. 1, Box 81 A, Union, Wash. 98592

Filed Mar. 6, 1974, Ser. No. 448,740
Int. Cl. A63g 1/12
U.S. Cl. 272—33 B 4 Claims



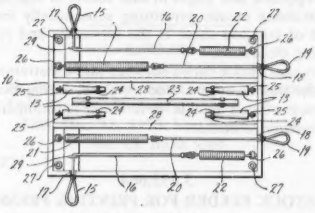
1. A roundabout comprising a generally circular base panel having a central area and adapted to be disposed in horizontal position on a horizontal support surface, a rotary platform disposed above said base panel and including supporting wheel means rollingly engaged with said base panel, means pivotally anchoring said platform to said base panel for rotation of the platform relative to said base panel about an upright axis extending through said central area and adjacent a predetermined portion of said platform, said platform including two relatively angulated generally straight sides converging toward a point at least closely adjacent said predetermined platform portion, said platform including a convex arcuate side interconnecting the divergent ends of said straight sides and having the opposite ends of said arcuate side generally equally spaced from said axis, the included angle defined by said straight sides being at least 90 degrees and no more than 120 degrees, the distance between said opposite ends of said arcuate side and said axis being generally equal to the radius of said base panel, said supporting wheel means being disposed entirely beneath and dependingly supported from said platform inwardly of said straight sides and said arcuate side, a pedal crank-equipped drive wheel journaled from said platform for rotation about an axis extending substantially radially of the axis of rotation of the platform relative to said base and a seat supported from said platform in position, relative to said wheel, such that a child seated on said seat may drive said wheel with his legs in the manner in which a child drives the front wheel of a tricycle, said wheel being rollingly engaged with an outer peripheral portion of said base panel and disposed entirely outwardly of one of said straight sides of said platform.

3,893,667
EXERCISE DEVICE WITH COMBINED SPRING TENSION AND FRICTIONAL RESISTANCE

Owen D. Snyder, Jr., St. Louis, and Cranmer W. Wilson, Hazelwood, both of Mo., assignors to Hide-A-Gym International, Inc., St. Louis, Mo.

Filed Apr. 3, 1974, Ser. No. 457,601
Int. Cl. A63b 21/02
U.S. Cl. 272—58 12 Claims

1. A portable exercise device comprising in combination a frame, support means, and exercise means, said frame having a longer and shorter dimension, bottom, interior and exterior surfaces and two ends, said frame having a bottom surface, an exterior surface and an interior surface, said frame being attached to and supporting said support means, and said frame housing exercise means, said exercise means comprising at least one side pull exercise means comprising attachment means, coil spring means, a side pull, a side pull loop, an eyelet and a side pull channel intersecting the bottom surface of the frame and being generally curvilinear in cross-section, said attachment means attaching one end of said coil spring means to one end of said frame whereby said coil spring means is positioned so that its direction of elongation is substantially parallel to the longer dimension of said frame, the other end of said coil spring means being attached to one end of said side pull, said side pull extending from said coil spring means to said eyelet in a direction substantially parallel to the longer dimension of said frame, said eyelet being attached to the other end of said frame passing and changing direction by about 90° through said eyelet and passing through said side pull channel in a direction substantially perpendicular to the longer dimension of said frame, the other end of said side pull being attached to said side pull loop, said side pull channel having a vertical depth at the interior surface of said frame of from about two to five times the maximum dimension of said side pull, a radius of curvature at the interior surface of said frame of from about 2.5 to about 4.5 times one half the maximum dimension of said side pull, a radius of curvature at the exterior surface of said frame of from about 1.25 to about 2 times one half of the maximum dimension of said side pull and a horizontal dimension at the bottom surface of said frame at least equal to the widest horizontal dimension of said channel in the plane parallel to the exterior surface of said frame and containing said horizontal dimension and said end pull exercise means comprising attachment means, coil spring means, end pull, end pull loop and end pull channel intersecting the bottom surface of the frame and being generally curvilinear in

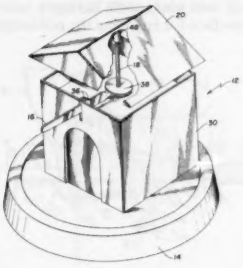


cross-section said attachment means attaching one end of said coil spring means to one end of said frame whereby said coil spring means is positioned so that its direction of elongation is substantially parallel to the longer dimension of said frame, the other end of said coil spring means being attached to one end of said end pull, said end pull extending from said coil spring means and passing through said end pull channel in a direction substantially parallel to said longer dimension of said frame, the other end of said end pull being attached to said end pull loop, said end pull channel having a vertical depth at the interior surface of said frame of from about two to about four times the maximum dimension of the end pull, a vertical depth at the exterior surface of said frame of from about one to about two times the maximum dimension of the end pull, a radius of curvature at the interior surface of said frame of from about 2.5 to about 4.5 times one half of the maximum dimension of said end pull, a radius of curvature at the exterior surface of said frame of from about 1.25 to about 2 times one half of the maximum dimension of said end pull, and a horizontal dimension at the bottom surface of said frame at least equal to the widest horizontal dimension of said channel in the plane parallel to the exterior surface of said frame and containing said horizontal, dimension, whereby said exercise device provides healthful and invigorating exercise activity resulting from the interaction of spring tension and frictional resistance and, when not in use for exercising, provides a useful and decorative piece of furniture.

3,893,668
OPERATING MECHANISM FOR A TOY GAME

Joseph E. Mitchell, 435 Orlena Ave., Long Beach, Calif.

Filed Aug. 22, 1974, Ser. No. 499,514
Int. Cl.[2] A63F 9/00
U.S. Cl. 273—1 R 12 Claims

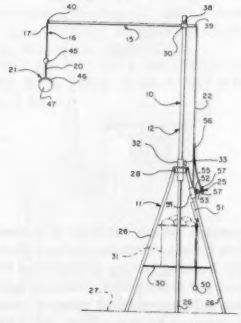


1. An operating mechanism for a toy game comprising
a flexible rod;
housing means for the rod;
lever support means positioned a fixed distance from the rod;
a lever pivotally attached to the lever support means; and
an apertured disc surrounding the rod and operatively positioned relative to the lever so that when the lever is pivoted the edge of the aperture formed in the disc engages the rod to withdraw the rod from the housing.

3,893,669
TETHERED BALL TENNIS INSTRUCTION DEVICE

Gilford Myers, 1141 Westbury Rd., Jenkintown, Pa. 19046

Filed Apr. 2, 1973, Ser. No. 347,323
Int. Cl. A63b 69/38
U.S. Cl. 273—29 A 7 Claims

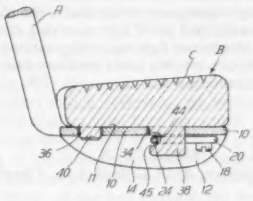


1. A tennis instruction device comprising a standard, an arm projecting laterally from said standard, a filamentary suspension member extending along said arm having one end depending freely from the projecting end of said arm and having its other end depending along said standard, a fabric having split pile loops on said one suspension member end for releasable holding engagement with a standard tennis ball, and an elongated suspension member retaining finger attached at one end to said standard and having its free end movable for retaining cooperation with said other suspension member end and selectively releasing the latter to drop said one suspension member end for ball replacement thereon.

3,893,670
GOLF CLUB WITH INTERCHANGEABLE HEADS

Franco Franchi, Via Montepulciano, 11, Milan, Italy

Filed Nov. 2, 1973, Ser. No. 412,266
Int. Cl. A63b 53/06
U.S. Cl. 273—80.1 11 Claims

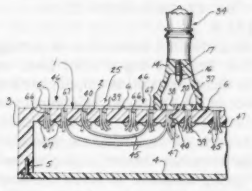


1. In combination, a golf club and a plurality of interchangeable and uniquely lofted club heads, comprising an elongated club shaft having a support plate fixedly secured to said shaft adjacent the lower end thereof, said support plate being elongated and extending outwardly from said shaft with its longitudinal axis perpendicular to the line of flight, said support plate having opposed front and rear surfaces, the front surface defining a support surface which is oriented at an angle with respect to the axis of said shaft, said plurality of interchangeable heads individually adapted for attachment to said support plate, each of said heads having a front impact surface and a rear mounting surface adapted to be engaged with said support surface when the respective head is mounted on said support plate, the impact surfaces as provided on the different heads being oriented at different angles with respect to the axis of said shaft, and connecting means coacting between said heads and said support plate for permitting each head to be individually releasably connected to said support plate, said connecting means including an opening formed in said support plate and extending therethrough from said support surface to said rear surface and a projection fixedly secured to each of said heads and projecting outwardly from the mounting surface thereof, said projection having a length greater than said opening so as to project through said opening and beyond said rear surface when said head is mounted on said support plate, said connecting means further including a locking member movably mounted on said support plate adjacent the rear surface thereof and engageable with said projection for fixedly connecting the head to the support plate.

3,893,671
FIBER OPTIC CHESSBOARD

Robert C. Gardner, 1629 W. Lawn Ave., Milwaukee, Wis. 53209

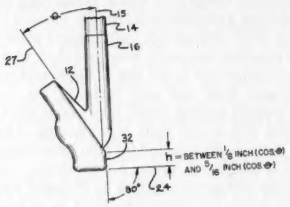
Filed Sept. 3, 1974, Ser. No. 502,757
Int. Cl. A63f 3/02
U.S. Cl. 273—136 A 8 Claims



1. In a game having playing pieces and a playing board which indicates a plurality of positions to which a set of playing pieces can be moved, the improvement therein comprising:

illuminator means mounted within each playing piece;
light transmission stations formed on said playing board and located within indicated positions thereon to receive light from the illuminator means within a playing piece which is moved onto one of said indicated positions;
light receiving stations formed on said playing board and located within said indicated positions; and
light conducting means connecting each light transmission station with a selected set of light receiving stations, each of said sets of selected light receiving stations indicating the character of a playing piece positioned on its associated light transmitting station.

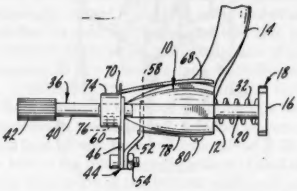
3,893,672
GOLF CLUB
Theodore R. Schonher, 4818 Gifford Ave., Cleveland, Ohio 44144
Filed May 23, 1974, Ser. No. 472,538
Int. Cl. A63b *53/04*
U.S. Cl. 273—167 A **7 Claims**



1. In a golf club having a shaft and club head, said club head having a bottom surface sole disposed between a heel and toe, the sole of said club head having a horizontal baseline, said club head having a hosel interconnected with said shaft, said club head having a sloped, planer surface inclined with the vertical to define a loft angle therebetween of between about 20° to 46°, said sloped hitting surface disposed between said heel and toe and having a centroid on said sloped hitting surface, the improvement which comprises:
a blunt leading surface disposed between said toe and heel and extending vertically upward from said sole, said blunt leading surface being a non-hitting surface terminating with the intersection of said sloped surface below the centroid on the sloped hitting surface, said vertical leading surface being at least about one-sixteenth inch in vertical height from said baseline and less than about 70 percent of the vertical distance of the centroid from said baseline of the sole of said club.

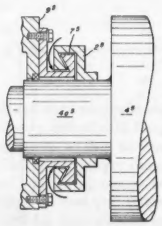
3,893,673
TRAINING PUTTER
Medard W. Welch, 1111 Sheridan Rd., Winnetka, Ill. 60093
Filed Sept. 30, 1974, Ser. No. 510,481
Int. Cl. A63b *69/36, 53/08*
U.S. Cl. 273—183 R **3 Claims**

1. A device for use in the instruction of putting a golf ball comprising a club head having a front face, an elongated handle affixed to the club head, an impact surface associated with the front face of the club head, said impact surface being rigidly mounted at the end of a pin which is slidably supported in an opening through the club head extending axially generally normal to the front face thereof, urging means comprising a compression spring effective to force the impact surface outward away from the face of the club head, loading means effective to preset the force to be exerted by the urging means to any of an infinite number of settings within a predetermined range, said loading means comprising a micrometerlike threaded load dial, the rotation of which in one direction being effective to compress the compression spring and rotation in the other direction allowing the spring to expand, calibrations associated with said loading means for indicating the setting thereof, an indicator effective to cooperate with said calibrations to indicate the position of the threaded load member relative to the club head, and a release mechanism for activating the urging means, said device further comprising at least two of said pins, each having a notch cut laterally across its top surface for engaging the release mechanism, said



release mechanism comprising a generally vertical release plate, guide means associated with the club head, to restrict said release plate to movement in a generally vertical plane adjacent the backside of the club head, and a lock spring urging the release plate downward into engagement with the pins, thereby being effective to engage the release plate in the notches of the pins and to retain the impact surface in a position adjacent the front face of the club head against the urging of the compression spring.

3,893,674
NON-FRICTIONAL CLOSURE FOR EXCLUSION OF CONTAMINANTS
Terry E. Paradine, Gary, Ind., assignor to United States Steel Corporation, Pittsburgh, Pa.
Filed Dec. 26, 1973, Ser. No. 428,469
Int. Cl. F16j *15/44*
U.S. Cl. 277—56 **4 Claims**

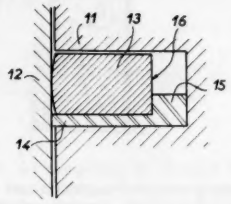


1. In an apparatus which includes a rotating, generally cylindrical shaft; a housing circumscribing a journaled portion of said shaft, said housing having a clearance between it and the shaft; a closure for sealing said clearance against the entry of contaminating substances, said closure comprising (i) a shaft-connected member having a bore, the surface of which is in tight engagement with an outwardly displaced circumferential portion of said shaft, said shaft-connected member having a flange portion with a washer-like face, and (ii) encircling said shaft, a housing-connected member having a flange portion with a washer-like face for non-frictionally mating with the washer-like face of said shaft-connected member, whereby said housing-connected and shaft-connected members form a substantially enclosed chamber sealed against the entry therein of said contaminating substances,
the improvement wherein said mated washer-like faces are inclined toward the direction of ingress of said contaminating substances, at an angle of from about 10°–40° with respect to a plane orthoganol to the axis of said shaft.

3,893,675
SEALING JOINTS FOR PISTON RINGS

Robert Geffroy, Neuilly-sur-Seine, France, assignor to Sealfire, Luxembourg

Filed May 10, 1973, Ser. No. 358,992
Claims priority, application France, May 16, 1972, 72.17495
Int. Cl. F16j *15/00*
U.S. Cl. 277—194 **2 Claims**

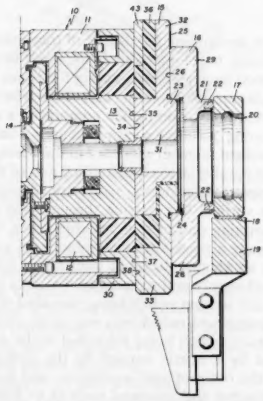


1. A seal comprising an outer cylindrical member of an internal combustion engine, a piston adapted to reciprocate within said member and have one axial end subjected to internal combustion actuating pressure, a groove in the outer periphery of said piston, a ring assembly within said groove consisting of two pieces, one piece being a metal piston ring, the other piece being a plastic sealing joint having a cross section with L-shaped legs, one of said legs extending between adjacent surfaces of said ring and groove remote from said piston end and being adapted to contact said cylindrical member for sealing purposes, the other leg engaging the radially inner face of said metal ring, whereby peripheral wear of the sealing joint against said cylindrical member is limited to the wear of said metal ring, axial clearance between said ring assembly and the groove surface closest to said piston end providing a path for combustion pressure to act on adjacent surfaces of said metal ring and plastic joint.

3,893,676
MAGNETIC CHUCK

Leon J. Gloshinski, Northboro, and Donald R. Johnson, Worcester, both of Mass., assignors to Cincinnati Milacron-Heald Corp., Worcester, Mass.

Filed Jan. 17, 1974, Ser. No. 433,988
Int. Cl. B23b *31/10;* **B25b** *11/00;* **B24b** *5/02*
U.S. Cl. 279—1 M **3 Claims**



1. A machine tool, comprising

a. a housing having an annular electro-magnetic coil mounted therein,

b. a rotatable spindle mounted in the housing concentrically of the coil,

c. a first backing plate element mounted on the spindle and rotatable with it, the first element being provided with a central hub from which integral arms extend outwardly to provide a first pole, there being segmental inserts located between the arms and being held fixedly in place and insulated from the arms to form second poles,

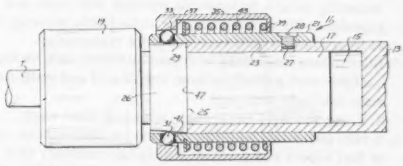
d. a second backing plate element mounted on the first backing plate element and having an axially-extending lip for contact with a workpiece, the second element being provided with an axial bore concentric with the said lip and being divided into a plurality of segments by radial layers of insulation, the segments being alternately first poles and second poles to match the arms and inserts, respectively, of the first element, the first element being provided with an axially-extending boss, while the second element is provided with a recess to receive the boss, the elements being held in face-to-face relationship,

consisting of an annular element inserted in a groove on the lip that is concentric with the bore and consisting of a plurality of hardened inserts separated by narrow gaps which are filled with material that acts as an insulation to electro-magnetic lines of force.

3,893,677
QUICK CHANGE SPINDLE ADAPTER FOR TOOL HOLDER

Theodore M. Smith, Detroit, Mich., assignor to Lucille G. Smith, trustee and Theodore M. Smith, trustee, both of Mt. Clemens, Mich.

Filed Dec. 26, 1973, Ser. No. 428,243
Int. Cl. B23b *31/22*
U.S. Cl. 279—75 **6 Claims**



1. A quick change adapter for a power rotated spindle having a bore adapted to receive a tool holder;

a cylindrical body having a uniform axial bore mounted upon and secured to said spindle and projecting forwardly thereof;

a forwardly retractable spring biased sleeve movably mounted on said body and including a rearwardly and outwardly tapered inner wall;

a tool holder mounting a tool projected into said body with a shank snugly nested in the spindle bore;

and a collar of circular crossection on said tool holder intermediate its ends projected into said body and bearing against the end of said spindle;

there being a series of spaced balls movably nested in said body in a single transverse plane; portions of said balls projected radially inward retainingly engaging said collar and projected radially outward for cooperative engagement with said tapered inner wall;

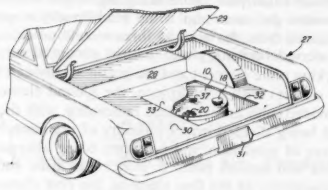
the tapered inner wall of the sleeve converging relative to the collar surface providing a cooperating wedging action of the balls between the collar and the sleeve inner wall for anchoring said tool holder within said body and against the end of said spindle, whereby forward manual retraction of said sleeve releases said balls facilitating assembly to and manual removal of said tool holder from said body and spindle.

3,893,678

AUXILIARY FUEL TANK

Victor E. Engdahl, 28 W. Lewis, Phoenix, Ariz. 85003

Filed Mar. 27, 1974, Ser. No. 455,356
Int. Cl. B60p *3/22*
U.S. Cl. 280—5 A **1 Claim**



1. For use in connection with a motor vehicle which includes
   a standard equipment fuel tank having filler means and vent means,
   a fuel pump for drawing fuel from said standard equipment fuel tank,
   a fuel line communicating between said standard equipment fuel tank and said fuel pump,
   a spare tire receptacle sized and shaped to receive a wheel and tire assembly for said vehicle, and
   an anchor within said receptacle for attaining retaining means for detachably securing said wheel and tire assembly,

an auxiliary fuel tank system comprising:

a. a generally cylindrical fluid-tight tank having a pair of spaced end walls and sized and shaped to be received within said spare tire receptacle;

b. a tube extending through said auxiliary tank and sealingly engaged with each said end wall;

c. retaining means, extendable through said tube and engageable with said anchor, for detachably securing said auxiliary tank within said spare tire receptacle;

d. filler means associated with said auxiliary tank including
   i. a filler neck extending from one of said end walls proximate said side wall, and
   ii. a cap sealingly engageable with said filler neck;

e. a vent proximate said filler means for atmospheric relief of fuel vapors and pressure within said auxiliary tank and capable of connection to the vent means of said standard fuel tank;

f. fluid pick-up means extending into said auxiliary tank and spaced diametrically from said filler means for receiving fuel from said auxiliary tank,

whereby said tank is operative when placed in either horizontal or vertical spare tire receptacles; and

g. a valve in said fuel line and communicating with said fluid pick-up means for operatively and selectively connecting either said standard equipment fuel tank or said auxiliary tank with said fuel pump.

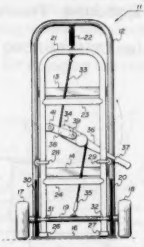
3,893,679

HAND TRUCK STEP CLIMBER

Howell M. Sumrall, 4447 Marraco Dr., San Diego, Calif. 92115

Filed May 14, 1973, Ser. No. 360,400
Int. Cl. B62b *5/02*
U.S. Cl. 280—5.3 **1 Claim**

1. A hand truck step climber mechanism comprising:
   a standard hand truck having a frame, an axle and a pair of wheels rotatably coupled to the axle together with a loading platform coupled to the bottom portion of the frame;
   a lifting frame slideably coupled to said hand truck frame and disposed behind the hand truck on the opposite side of the lifting platform;
   an expansion spring coupled between said lifting frame and the top of said hand truck frame;
   a cable coupled between the top of said lifting frame and said hand truck axle through a lifting winch, said lifting winch being rotatably coupled to said lifting frame; and
   a lifting arm coupled to said lifting winch for pivoting said lifting winch and effectively shortening the length of said cable whereby said standard hand truck is lifted with respect to said lifting frame.

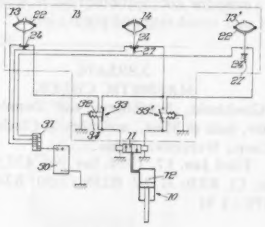


3,893,680

DEVICES FOR LIMITING TRANSVERSAL LEANING OF VEHICLES

Roland Marcillat, Chevannes, and Gérard Mantoux, Bois D'Arcy, both of France, assignors to Ets NICOLAS & Fils, France

Filed Jan. 21, 1974, Ser. No. 435,330
Claims priority, application France, Jan. 24, 1973, 7302492
Int. Cl. B60g *19/00*
U.S. Cl. 280—6 H **6 Claims**



1. A device for limiting the degree of transversal leaning of a vehicle having two longitudinal side rows of independent axles, each axle having a single-acting fluid ram for adjusting the vertical distance between the axis of the wheels of the axle and the vehicle body, said device comprising a sensor of the degree of leaning including a casing securely connected to the body and a weight member mounted in the casing for rotation about an axis parallel to the longitudinal axis of the vehicle, at least two electrical switches symmetricallypositioned with respect to a vertical line passing through said member axis each for operating one of said switches when the degree of leaning exceeds a predetermined value, said switches being arranged in an electrical circuit controlling solenoid valves which control supply and exhaust of the rams in one row at least, each said sensing switch being provided with means for resiliently urging said switch into one of its closed and open conditions, each switch being subjected to the action of a gas jet delivered by a nozzle carried by the casing, urging the switch into the other of said conditions, said weight member being constructed and arranged such as to interrupt one of said jets upon the degree of leaning exceeding said predetermined value.

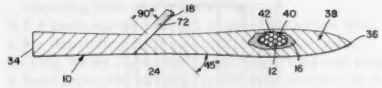
3,893,681
SKI

Lindley Manning; Robert B. McKee, both of Reno, Nev.; Hubert Zemke, Dublin, Calif., and Bruce M. Douglas, Sparks, Nev., assignors to The Tensor Corporation, Reno, Nev.

Division of Ser. No. 162,600, July 14, 1971, Pat. No. 3,740,301, which is a continuation-in-part of Ser. No. 55,768, July 17, 1970, abandoned. This application Mar. 30, 1973, Ser. No. 346,380

Int. Cl. A63c *5/04*

U.S. Cl. 280—11.13 N **7 Claims**



1. A lightweight ski comprising an elongate honeycomb sandwich defined by an open celled core having a ribbon direction parallel to the ski length, and facings bonded to the core and having a length greater than the length of the core, said facings being comprised of a multiplicity of substantially straight parallel strands extending over and beyond the length of the core, a curved ski tip formed by the portion of the facings which extend beyond the length of the core and which curved tip extends out of the plane of the remainder of the ski, a plurality of individual tabs bonded to the sandwich on both of the lateral sides of the sandwich, and a longitudinally extending ski edge connected to and depending downwardly from the tab on each of the lateral sides of the sandwich, said ski edges being constructed of a plurality of wound metallic strands which are wound to have a substantially square cross section.

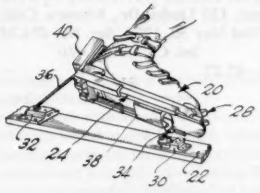
3,893,682
RELEASABLE SAFETY SKI BINDING HAVING A SELF-ESTORING CAPABILITY

Burton A. Weinstein, New York, and Gordon C. Lipe, Skaneateles, both of N.Y., assignors to National Recreation Industries, Inc., Stamford, Conn.

Filed Apr. 4, 1973, Ser. No. 347,870

Int. Cl. A63c *9/08*

U.S. Cl. 280—11.35 N **25 Claims**



1. A ski binding coupling a ski boot on a ski and releasably holding it in alignment therewith in a normal skiing position, the binding comprising:

a soleplate arranged for positioning in underlying contact with the ski boot and for detachable connection thereto; at least one mounting element secured to the ski, said mounting element being proximate said soleplate when the ski boot is in such skiing position;

at least one connecting means carried by said soleplate for connecting said soleplate to said mounting element, said connecting means including:

a leash support on said soleplate;

an elongated, flexible leash supported at least partially on said leash support and connected with said mounting element, said leash being extendible and retractable from said leash support to permit said soleplate and mounting element to move toward and away from one another and being in a retracted condition when said mounting element is proximate said soleplate; and

biasing means on said soleplate acting on said leash and including means for applying a retraction force to said leash to resist separation of said soleplate from said position proximate said mounting element and control means for varying the effectiveness with which said retraction force is applied, said biasing means being responsive to a force, acting through said leash and tending to separate said soleplate from said mounting element, in excess of a predetermined magnitude to permit said leash to extend from its retracted condition and said soleplate to move out of such skiing position and, thereafter, being responsive to reduction of such separating force to a magnitude below the retraction force being then applied to said leash to initiate retraction of said leash toward its retracted condition and to continue such retraction so long as the separating force is below the retraction force being then applied to said leash, until said leash returns to its retracted condition.

3,893,683
APPARATUS FOR RELEASING A SAFETY SKI BINDING

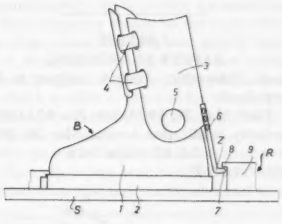
Ernst Gertsch, Wengen, and Ulrich Gertsch, Interlaken, both of Switzerland, assignors to Gertsch AG, Wengen, Switzerland

Filed Mar. 27, 1972, Ser. No. 238,062

Claims priority, application Switzerland, Apr. 1, 1971, 4746/71

Int. Cl. A63c *9/08*

U.S. Cl. 280—11.35 R **26 Claims**



1. An apparatus for releasing a safety ski binding comprising actuation means adapted to be affixed to the lower shank of the leg above the ankle joint in cooperating relation with a ski boot, said actuation means further adapted to be operatively connected to an automatic release mechanism of a safety ski binding for releasing said automatic release mechanism upon pronounced bending of the lower shank of the leg relative to the ski, said actuation means comprising a double-arm lever and further adapted to be pivotally retained on the ski boot at a location spaced from the point of operative connection of said actuation means with said automatic release mechanism.

3,893,684
SAFETY SKI BINDING

Gottfried Schweizer, Vienna, Austria, assignor to Gertsch AG, Zug, Switzerland

Filed Dec. 26, 1973, Ser. No. 427,499

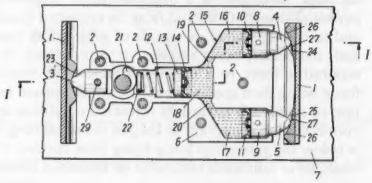
Claims priority, application Austria, Dec. 29, 1972, 11173/72

Int. Cl. A63c *9/08*

U.S. Cl. 280—11.35 T **10 Claims**

1. In a safety ski binding for use in securing a ski boot to a ski having an improved safety release mechanism, in which a damping and/or delay mechanism comprising piston means for effecting a displacement of a fluid through a throttle open-

ing prevents the unintended release of the binding, whereby said fluid in turn moves a reaction piston which is under the pressure of a resilient means, the improvement comprising wherein said iston means comprises means defining at least three cylinders, two of said cylinders each having a piston therein adapted to receive the forces attempting to effect a release of said ski binding, said reaction piston being mounted in the third cylinder and being movable against the force of said resilient means in response to a displacement of fluid from one of said two cylinders into said third cylinder and

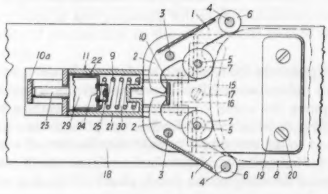


external force receiving means engaging each of said two pistons and effecting an application of a force to each of said two pistons, one of said pistons engaged with said force receiving means being moved in response to a relative horizontal lateral movement between said one piston and said force receiving means, both of said pistons engaged with said force receiving means being simultaneously moved in response to a relative vertical movement between said pistons and said force receiving means, a simultaneous movement of both of said pistons requiring more force than a movement of just one of said pistons.

3,893,685
SAFETY SKI BINDING

Josef Svoboda, Schwechat, Austria, assignor to Gertsch AG, Zug, Switzerland

Filed May 28, 1974, Ser. No. 474,040
Claims priority, application Austria, May 30, 1973, 4786/73
Int. Cl. A63c *9/08*
U.S. Cl. 280—11.35 T **8 Claims**

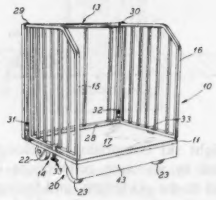


1. In a safety ski binding having a binding element with locking means which lock to a predetermined normal level of force said binding element in an effective position and upon exceeding said predetermined normal level of force release said binding element for a movement out of said effective position and retarding means for retarding a release movement of said locking means to a force level higher than a normal release force, said retarding means being defined by a pneumatic damping first cylinder having reciprocal piston means therein biased to one end of said first cylinder by a spring, the improvement comprising wherein said piston means includes means defining a pneumatic second cylinder having means defining at first opening therein, a closure element mounted for movement into and out of engagement in said first opening and means defining a throttle second opening for restricting the movement of gas therethrough, said closure member permitting no gas movement through said first opening in one direction but permitting gas flow therethrough in the other direction.

3,893,686
COLLAPSIBLE CART

Lawrence M. Morgan, Anoka, Minn., assignor to The Cornelius Company, St. Louis Park, Minn.

Filed Mar. 18, 1974, Ser. No. 451,929
Int. Cl. B62b *3/00*
U.S. Cl. 280—36 R **12 Claims**



1. A collapsible merchandise cart, comprising:

a. a bottom frame having a normally generally horizontal platform for support of goods thereon, and a rear edge;

b. a transverse hinge having a front portion secured to the rear of said bottom frame;

c. front and rear support means disposed below said bottom frame and below said hinge and all secured to said bottom frame, said rear support means normally extending horizontally beyond said rear edge of said bottom frame;

d. a rear frame secured to a rear portion of said hinge and having a lower edge, said rear frame being pivotable between a normally upright position generally perpendicular to said bottom frame, and a collapsed position generally horizontal and parallel to said bottom frame;

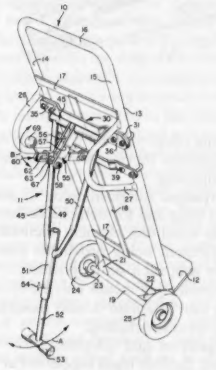
e. means operable between said frames to lock said rear frame in said upright position; and

f. said rear support means and said lower edge of said rear frame jointly forming means for supporting the cart, when collapsed, in an upstanding position in which both said frames are upright.

3,893,687
HAND TRUCK WITH SAFETY STAND

Leslie E. Victor, 120 Linden Dr., Ventura, Calif. 93003

Filed May 30, 1974, Ser. No. 474,357
Int. Cl.² B62B *1/10*
U.S. Cl. 280—47.27 **9 Claims**



1. A safety stand for use with a hand truck of the type

having a back support and base platform, the safety stand comprising:

a. bracket means capable of being removably mounted to a relatively upper portion of the hand truck back support;

b. a support leg unit pivotally coupled to a relatively upper part of the bracket means and arranged for free swinging movement in response to gravity force towards and away from the hand truck back support as the hand truck is tilted forwardly and rearwardly respectively the support leg including,

b.1 a cross bar pivotally coupled by its opposing ends to the bracket means,

b.2 a pair of side members depending from adjacent the opposing ends of the cross bar,

b.3 a joint interconnecting the side members, and,

b.4 a depending strut coupled to the joint; and,

c. locking means connected to the support leg unit including a hand operable release mechanism coupled to a relatively lower part of the bracket means and releasably engaging the locking means, the release mechanism having an adjustable catch for selectively varying and fixing the swing angle of a support leg unit.

3,893,688

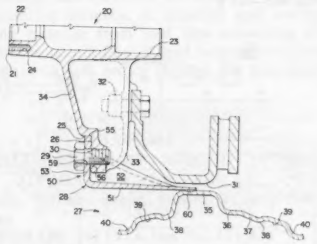
TIRE CARRYING RIM

Robert A. De Regnaucourt, Centerville, Ohio, assignor to Dayton-Walther Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 361,067, May 17, 1973, abandoned. This application July 5, 1974, Ser. No. 486,020

Int. Cl. B60c *5/16*

U.S. Cl. 301—12 R **8 Claims**



1. A tire carrying rim having a radially inwardly directed flange for mounting on a wheel,

a wheel having a hub with a series of spokes, the

outer end of each wheel spoke having a felloe comprising two intersecting surfaces, an axially oriented rim flange piloting surface and a radially directed rim flange seating surface, said seating surface having a first bore for receiving a fastening means inserted through said flange,

a flange being secured to and mounted beneath a conforming annular surface on said rim and providing a series of spoke cap areas uniformly spaced with each having a second bore for receiving the fastening means to be inserted in the first bore,

each flange spoke cap area having an axially extending web portion, dual axially directed side portions and a radially directed face portion, said web portion, side portions and face portion being interconnected to provide a unitary spoke cap area, each second bore being formed in a face portion,

said tire carrying rim being mounted by positioning each of said spoke cap areas over and on a spoke felloe, with each spoke cap area face portion on a spoke felloe piloting surface and against a spoke felloe seating surface.

3,893,689

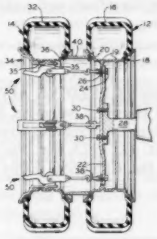
AUXILIARY WHEEL ATTACHING MEANS

Leonard J. Verhoff, R.R. No. 2, Box No. 150, Continental, Ohio 45831

Filed Apr. 16, 1968, Ser. No. 721,737

Int. Cl. B60b *11/06*

U.S. Cl. 301—39 R **13 Claims**



1. In combination with a dual rim assembly of the type wherein an auxiliary rim is spaced by a cylindrical ring means from a main rim of a vehicle wheel having a plurality of clamp lugs with hook engaging means thereon, and said auxiliary rim includes inner and outer axially outwardly extending terminal rim edge flanges and therebetween a central base portion and a stepped portion including an axially extending tire bead seat flange, the improvement comprising at least three independent releasable and longitudinally adjustable connecting devices extending between and releasably engaging each hook engaging means and said auxiliary rim, each device comprising:

A. link means having a hook portion for attachment to one of said hook engaging means on the main vehicle wheel,

B. a flat strip means bridging said axially extending tire bead seat flange and supported by and parallel to the central base portion of said auxiliary rim, said strip means having a hook portion at one end for removably engaging the outer axially extending terminal rim edge flange of said auxiliary rim, and

C. adjustable means secured to said link means and engaging said flat strip means near its other end for varying the distance between said link means and said strip means.

3,893,690

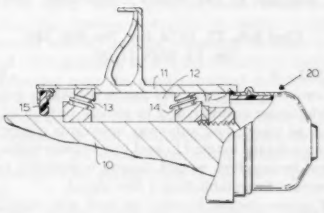
HUB CAP ASSEMBLY

Ronald A. Yapp, Ann Arbor, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Filed Nov. 16, 1973, Ser. No. 416,690

Int. Cl. B60b *27/00*

U.S. Cl. 301—108 A **21 Claims**



1. A closure device for a wheel hub rotatably mounted upon an axle, including in combination:

a diaphragm member having a generally cylindrical wall joined to a cover wall that is movable axially with respect

to said hub to accommodate expansions and contractions of gases and lubricant contained within said hub,

and

a protective metal shell having a cylindrical portion surrounding, overlying and continuously engaging the cylindrical wall of said diaphragm member in a leak-tight fit and having a radially extending retention means at one end for limiting axial movement of said cover wall and normally spaced therefrom and a central opening in said radially extending retention means.

3,893,691

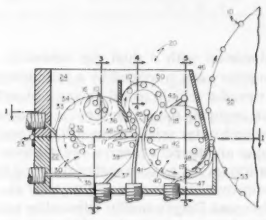
COMPONENT FEEDING APPARATUS

David Kearney, and Harold Kontrovitz, both of Keene, N.H., assignors to Markem Corporation, Keene, N.H.

Filed Oct. 11, 1973, Ser. No. 405,393

Int. Cl.[2] B65G *53/04*

U.S. Cl. 302—2 R **11 Claims**



1. Component feeder apparatus for discrete parallelized feeding of axially extended components, said apparatus comprising

a chamber having a generally closed curved inner surface for guiding said components therearound in a closed path, the maximum transverse dimension of said inner surface being substantially less than its axial dimension to prevent reversal of said components within said chamber air jet passages communicating through said surface at an angle thereto for blowing said components around said surface

an inlet for feeding said components into said chamber and a tangential slot for feeding a series of parallelized components from said chamber while others of said components continue to move around said surface.

3,893,692

COMBINATION VEHICLE STABILIZER COMPENSATED TO PREVENT AUTOMATIC BRAKE APPLICATION IN NORMAL TURN OR IN PASSING

Rex W. Presley, and Lawrence E. Slimak, both of Southfield, Mich., assignors to The Bendix Corporation, South Bend, Ind.

Filed Feb. 27, 1974, Ser. No. 446,246

Int. Cl. B60t *11/00*

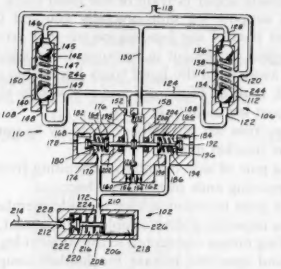
U.S. Cl. 303—7 **9 Claims**

1. An anti-sway apparatus for use in a braking system of a tow vehicle-trailer combination to reduce motion adverse to a direction of travel, said anti-sway apparatus comprising:

first sensor means located in said tow vehicle-trailer combination having first weight means responsive to lateral movement for establishing a first signal;

second sensor means located on said tow vehicle-trailer combination, a fixed distance from said first sensor means having second weight means responsive to lateral movement for establishing a second signal;

comparator means connected to said first sensor means and said second sensor means for developing a brake actuation signal for simultaneously operating the brakes of the trailer when said first signal is different than said second signal; and



control means located on said tow vehicle-trailer combination for nullifying said brake actuation signal during periods of longitudinal acceleration of the tow vehicle-trailer combination.

3,893,693

ANTI-LOCK CONTROL VALVE INCLUDING A DISPLACEABLE FLOW-MEASURING PISTON

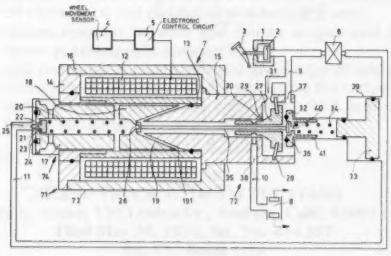
Derek Robert Skoyles, Salfords, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 10, 1973, Ser. No. 395,911

Claims priority, application United Kingdom, Aug. 29, 1973, 43227/73

Int. Cl. B60t *8/06*

U.S. Cl. 303—21 F **5 Claims**



1. A fluid pressure control device comprising:

a fluid flow control assembly having a fluid path extending between inlet and outlet ports, said assembly including a flow control orifice, for producing a pressure differential between said inlet and outlet ports of said assembly:

a displaceable flow-measuring piston across which a fluid pressure difference can be established due to the restriction by said flow control orifice to flow of fluid in said path, a seat disposed in said fluid path for cooperation with said flow measuring piston, said fluid pressure difference providing a force tending to displace said flow-measuring piston into sealing engagement with said seal to limit fluid flow out of said outlet port;

an elongated axial first passageway having an orifice disposed therein, said passageway extending axially through said flow-measuring piston;

a sealing and balancing member disposed at the side of the flow-measuring piston remote from said outlet port having a surface configured for sealing engagement about one end of said elongated axial first passageway which is in fluid communication with said outlet port, a second passageway disposed in said sealing and balancing mem-

ber in fluid communication with said orifice and within the seal boundary to provide a fluid pressure equalizing part for applying fluid pressure at said outlet port to an equalizing area of said sealing and balancing member about said aperture, which equalizing area is isolated from fluid pressure at said inlet port;

a solenoid valve mechanism disposed in said fluid flow path, said mechanism having a relief port;

an armature of said mechanism, said armature being responsive to an electric potential to cause said valve mechanism to open said relief port, said mechanism including biasing means urging said valve mechanism toward a closed position;

said mechanism further including a flow-measuring member which is displaceable against the force of said biasing means by a force produced by a fluid pressure difference across said flow-measuring member due to a flow of fluid into said relief port, to displace said armature against said solenoid force so as to tend to cause said valve to close said relief port, the flow rate into said relief port being thereby held at a substantially constant value at which the force produced by said fluid pressure difference is substantially equal to said solenoid force; and

means for mechanically engaging said flow-measuring member with said sealing and balancing member so that said biasing means acts effectively when said solenoid is unenergized to urge said flow-measuring piston away from said cooperating seat in opposition to the force due to the fluid pressure difference across said flow-measuring piston, whereby the flow rate of fluid into said outlet port is a function of the force of said biasing means and the cross-sectional area of said flow control orifice, until the difference between the fluid pressures at said inlet and said outlet ports is sufficiently low for the biasing means, acting through said means for mechanically engaging said flow-measuring member, to separate said sealing and balancing member from said flow-measuring piston, whereafter to permit flow of fluid between said inlet and outlet ports via said orifice through the flow-measuring piston.

3,893,694
HYDRAULIC PRESSURE ANTISKID CONTROL APPARATUS FOR A VEHICLE

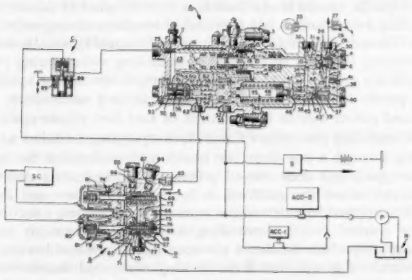
Masami Inada, Toyoake, Japan, assignor to Aisin Seiki Co., Ltd., Japan

Filed Oct. 31, 1973, Ser. No. 411,439

Claims priority, application Japan, Oct. 31, 1972, 47-109053

Int. Cl. B60t *8/02*

U.S. Cl. 303—21 F **11 Claims**



4. A hydraulic pressure antiskid control apparatus for a vehicle braking system having a master cylinder and slave wheel cylinders, comprising:

a first pressure accumulator;

first valve means interposed within a flow path between the vehicle master cylinder and the wheel cylinders;

power piston means for receiving the hydraulic pressure within the flow path which includes said first valve means, upon one side thereof and for receiving the hydraulic pressure of said pressure accumulator upon the other side thereof;

chamber means for transmitting said hydraulic pressure from said pressure accumulator to said power piston means;

changeover valve means for alternately connecting said chamber means to said pressure accumulator and a reservoir, said changeover valve means being operative by electrocircuit means for detecting wheel lock conditions; means for detecting failure of said hydraulic pressure for actuating said power piston means;

a second pressure accumulator; and

second valve means responsive to said failure detecting means and connecting said second pressure accumulator with said chamber means.

3,893,695
METHOD AND CIRCUIT ARRANGEMENT FOR CONTROLLING THE BRAKING OF A DRIVE

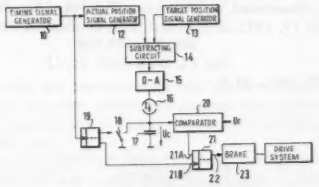
Alfons Rickert, Schallern, Germany, assignor to Nixdorf Computer AG, Paderborn, Germany

Filed Jan. 2, 1974, Ser. No. 429,792

Claims priority, application Germany, Dec. 30, 1972, 2264323

Int. Cl. B60t *8/00*

U.S. Cl. 303—21 P **8 Claims**



1. A method for controlling the braking of a drive to slow the movement of an object along a predetermined path until a target position is reached, comprising the steps of:

generating a plurality of time cycles which are repeated at equally spaced intervals along the path of movement;

generating a first signal which is the analogue of the respectively remaining distance to be travelled;

generating during a single time cycle a second signal having a magnitude which is proportional to the relationship between the actual velocity of the moving object and the respective remaining distance to be travelled;

comparing during said time cycle the magnitude of said second signal with a selected value which is constant during the braking operation to define a relationship between velocity and the remaining distance to be travelled corresponding to a linear velocity reduction which is effective over the predetermined distance compared with a parabolic slower speed reduction;

generating adjacent the end of said time cycle a third signal in response to said comparison to effect, depending on the sign of the comparison, either a braking or a freewheeling or an acceleration of the drive for the object; and

repeating, during other and progressively longer sequentially following time cycles, the foregoing steps to effect a step-by-step energizing and deenergizing a brake until said object has come to a complete stop at said target position.

6. A circuit for controlling the braking of a drive to slow the movement of an object along a predetermined path until a

target position is reached utilizing a time cycle which is derived from equally spaced path segments and indicating a value which is the analogue of the respectively remaining distance to be travelled for controlling the braking operation, comprising first signal generating means for generating a first signal indicating the end of the path, second signal generating means for generating a second signal indicating the actual position of the object along the path, a subtracting circuit responsive to said first and second signals, said subtracting circuit generating a first output signal which corresponds to the difference between said first and second signals, a variable output constant current source, a digital-analogue converter responsive to said first output signal for adjusting the working point of said current source, a capacitor adapted to be charged by the current from said current source, a switching mechanism controllable by timing signals which are derived from the movement of the object along the path for producing a time controlled discharging of said capacitor, a source of reference voltage, a comparator circuit for comparing said reference voltage with the voltage on said capacitor and adapted to produce a second output signal indicative of the comparison and a brake control circuit responsive to said second output signal for initiating a time controlled operation of said brake to effect a predetermined rate of decrease in said velocity of said object.

3,893,696

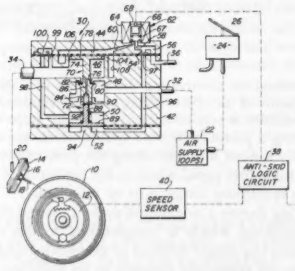
RELAY COMPENSATOR VALVE

John A. Urban, Livonia, and Gary L. Hopkins, Southfield, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 293,868, Oct. 2, 1972, abandoned, which is a continuation-in-part of Ser. No. 271,824, July 14, 1972, abandoned, which is a continuation of Ser. No. 125,280, March 17, 1971, abandoned. This application Apr. 8, 1974, Ser. No. 458,608

Int. Cl. B60t *8/06, 15/12*

U.S. Cl. 303—21 F **23 Claims**



6. In a skid control system for controlling the application of fluid pressure to fluid actuated brakes, a valve adapted for the cylical application of fluid pressure from a constant fluid pressure source to said fluid actuated brakes, said valve comprising:

a valve housing having an inlet pressure chamber adapted to be connected to the pressure source and an outlet pressure chamber,

an exhaust port in said housing,

valve means movable between an open and closed position for selectively interconnecting said pressure chambers,

fluid pressure operated control means for selectively actuating said valve means and communicating said exhaust port with said outlet chamber when said valve means is in a closed position,

operator means for cyclically applying control pressure to said control means to open said valve means and for cyclically releasing pressure on said control means to close said valve means and communicate said exhaust port with said outlet chamber, and

means operatively associated with said valve means for varying the position of said valve means during the cylical application of control pressure to said control means whereby the pressure in said outlet chamber rises first at a rapid rate and subsequently at a lower rate.

3,893,697

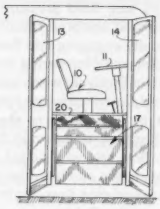
LOADING AND UNLOADING SYSTEM FOR BUS

Carmont Blitz; Hari N. Agrawal, and Leon S. Oliver, all of Chicago, Ill., assignors to The Blitz Corporation, Chicago, Ill.

Filed May 16, 1973, Ser. No. 360,762

Int. Cl. B60t *7/12*

U.S. Cl. 303—6.1 **11 Claims**

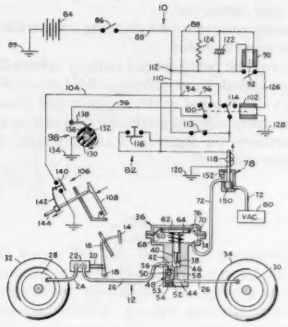


1. In an interlocked system for a driver controlled passenger carrying vehicle equipped with power operated doors and power operated brakes, the combination of an electrically controlled brake actuating means, a driver actuated control member for initiating brake application, driver actuated control means for initiating door operation including members for initiating door closing and door opening, respectively, each of said members having a normal, stand-by position from which it is moved to initiate an operation, the brake control member having one switch associated therewith and each door operating member having two switches associated therewith, all switches normally open in the stand-by condition of the associated member and being closed when the associated member is moved to initiate an operation, a power operated horizontal passenger accommodating platform, movable between an up position within the vehicle and a down position on the ground outside said vehicle, a platform up electric switch closed only when said platform is in the up position, a first power circuit through said closed up platform switch and, when operated, through the closed brake switch to one terminal of one door opening switch and to one terminal of one door closing switch; the remaining terminal of the one door opening switch and remaining terminal of the one door closing switch being respectively connected to an electromagnetic means for applying power to a door opening or door closing mechanism, a second power circuit independent of said first power circuit and including the other of said door operating switches and going through a one door two position control switch having door open and door closed positions, for operating doors, whereby when the platform is in the up position and the brakes applied, the driver can open or close doors; a second door control switch controlling a third power circuit and closed only when the doors are open and connected between a source of power and a distributing wire, said distributing wire having a connection to the electric brake actuator for locking brakes in set condition, supplemental circuits for applying power to move said platform in a desired direction, said last named supplemental circuits being connected to said distributing wire whereby platform movement is possible only when said doors are open and vehicle brakes are applied.

3,893,698
BRAKE CONTROL APPARATUS

John G. Fontaine, Fort Lauderdale, Fla., assignor to Fail Safe Brake Corporation, Fort Lauderdale, Fla.

Continuation-in-part of Ser. No. 261,968, June 12, 1972, Pat. No. 3,763,975. This application Oct. 24, 1972, Ser. No. 300,128
Int. Cl.[2] B60T *17/16, 13/74*
U.S. Cl. 303—89 3 Claims



1. An apparatus for controlling hydraulic brakes of a vehicle in which brakes are applied by hydraulic pressure in a conduit responsive to depression of a brake pedal, said apparatus comprising the combination of automatic two-way valve means in said conduit for controlling the hydraulic pressure therein, electrical control means controlling the opening and closing of said two-way valve means, said electrical control means automatically closing said two-way valve means to keep hydraulic pressure in said conduit applied to the brakes after depression of said brake pedal and being operative to maintain said two-way valve means closed against increased hydraulic pressure in said conduit, selectively operable means for causing said electrical control means to open said two-way valve means following the latter's automatic closing by said electrical control means to release the hydraulic pressure in said conduit, and normally-closed check valve means connected between opposite sides of said two-way valve means and operable automatically to open for allowing increasing hydraulic pressure in said conduit to bypass said two-way valve means to the brakes when said two-way valve means is kept closed by said electrical control means.

3,893,699
REFUSE BAG HOLDER

Ervin E. Morris, 1906 Waunona Way, Madison, Wis. 53713

Continuation-in-part of Ser. No. 162,610, July 14, 1971, abandoned. This application July 13, 1973, Ser. No. 379,169
Int. Cl. B62b *1/04*
U.S. Cl. 280—34 B 7 Claims

1. A holder for a refuse bag having an open and closed end comprising:

a. a bottom supporting plate for supporting the closed end of said refuse bag,

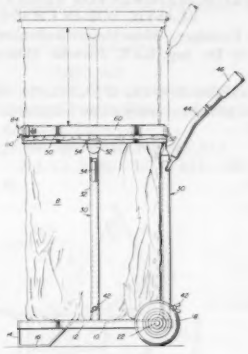
b. a pair of wheels operatively connected to and supported from said supporting plate for elevating the holder from the ground or supporting surface and permitting rolling movement of said holder thereover,

c. a plurality of legs securely mounted on said plate and extending upwardly in circumferentially spaced relation therefrom,

d. a circular shell securely mounted on the upper ends of said legs for receiving a refuse bag in folded position thereover, said shell comprising an outer, radially enlarged lower skirt section and a radially reduced upper section integrally formed with said skirt and separated therefrom by a generally flat shoulder section of substantial radial dimension, said upper section having an outwardly directed rim at its upper end over which a refuse bag can be stretched and retained,

e. a clamp ring for clamping a refuse bag on said shell, said clamp ring comprising a split ring which when closed tightly engages and holds the bag on the upper section of said shell and which when opened rests on said shoulder section of said shell and permits the bag to be removed from the rim,

f. means for pivotally mounting said clamp ring on said shell, said pivot means permitting movement of said clamp ring between a lower position resting on said shoulder section and encompassing said upper section of said shell and an upper, withdrawn position spaced from said shell for permitting placement or removal of a bag from said shell, and

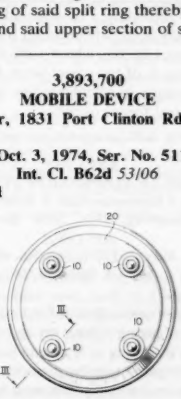


g. clamp means forming part of said clamp ring for tightly clamping the bag around the upper section of said shell and for releasing said clamp ring from said shell to permit said ring to be moved to its upper, withdrawn position for removal of said bag from said holder, said clamp means comprising a latch mechanism carried by the free ends of said split ring, the closing of said latch mechanism effecting the closing of said split ring thereby to tightly clamp said bag around said upper section of said shell.

3,893,700
MOBILE DEVICE

Kent W. Dunmyer, 1831 Port Clinton Rd., Fremont, Ohio 43420

Filed Oct. 3, 1974, Ser. No. 511,641
Int. Cl. B62d *53/06*
U.S. Cl. 280—79.1 3 Claims



1. An object adapted to be moved over a horizontal surface and having a bottom portion, said bottom portion carrying caster apparatus, said apparatus comprising:

at least one vertical support having a bottom disposed recess, said recess defining generally an upper hemisphere but being somewhat more of a spherical section, said recess having a circular horizontal groove in the recess surface;

at least one sphere having a diameter smaller than that of said recess; and

at least one ball bearing ring in which said sphere is rotatably disposed, said ring being locked onto the sphere, said ring engaging said groove whereby a portion of the sphere extends downwardly out of the recess and defines a spherical caster.

3,893,701

WHEEL SUSPENSION FOR VEHICLES WITH AN ELASTIC TOE-IN CHANGE

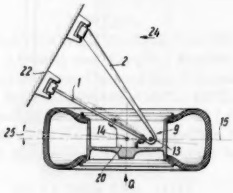
Wilhelm Kroniger, Munchingen-Kallenberg, Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Germany

Filed Nov. 16, 1973, Ser. No. 416,519

Claims priority, application Germany, Nov. 17, 1972, 2256358

Int. Cl. B60g *3/28*

U.S. Cl. 280—124 A **8 Claims**



1. A wheel suspension for vehicles having an elastic toe-in change which comprises guide means including guide arm means pivotally connected at a relatively fixed part and operatively connected with a wheel carrier means for guiding the wheel with respect to the relatively fixed part of the vehicle, characterized in that one guide arm consists of a leaf spring and is operatively connected with a relatively rigid guide arm means, and in that said guide arm means are connected with each other at the side thereof, opposite the pivotal connection of the guide means at the relatively fixed part, by way of a joint means effectively providing a substantially vertical pivot axis located substantially in the wheel center plane passing through the point of contact of the wheel with the road surface to effect a defined toe-in of the wheel when lateral forces occur and to prevent changes in wheel position in the toe-out direction when peripheral forces occur.

3,893,702

VEHICLE SUSPENSION SYSTEM

Johan H. Keijzer, 7 Septemberlaan 3, 3500 Hasselt, and Gerry O. Maes, Terbiestweg, 29A, 3800 Sint-Truiden, both of Belgium

Filed May 2, 1974, Ser. No. 466,230

Int. Cl. B60g *11/26*

U.S. Cl. 280—124 F **18 Claims**

1. A vehicle suspension system for use in operatively supporting the road engaging wheels on an automotive vehicle,

said suspension including at least one suspension strut comprising an elongated tubular pressure cylinder,

a valved piston reciprocably disposed in said cylinder and connected to one end of a piston rod extending axially from one end of said cylinder,

attachment means operatively securing one end of said piston rod to a sprung portion of the associated vehicle,

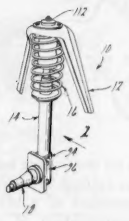
a rod guide assembly disposed at one end of said pressure cylinder for supporting said piston rod for reciprocal movement relative to said cylinder,

said assembly including a rod guide member defining a central bore within which said piston rod is reciprocally disposed, the outer end of said bore being formed with a counterbore defining an axially upwardly projecting annular flange and an annular recess extending around said piston rod,

an annular sealing element disposed within said recess adapted to slidably and sealingly engage the outer periphery of said piston rod,

an elongated reserve tube extending concentrically around said pressure cylinder,

said reserve tube being spaced radially outwardly from said pressure cylinder and defining a fluid reservoir therewith, a base valve located at the opposite end of said pressure cylinder from said rod guide and operable to control fluid flow between the interior of said pressure cylinder and said reservoir,



a wheel spindle located adjacent one end of said strut and including a first portion fixedly secured to the outer periphery of said reserve tube and a second portion removably secured to said first portion and adapted to support a vehicle wheel thereon,

the inner periphery of the end of said reserve tube adjacent said rod guide assembly being of substantially the same size as the outer periphery of said upwardly projecting annular flange and extending axially beyond the axially outer end of said flange, with the terminal portion thereof being deformed radially inwardly over at least a portion of the axially outer end of said flange, and

a helical coil spring extending around at least a portion of said strut and supported at one end by a spring support plate fixedly secured to said reserve tube, with the opposite end of said spring acting against the associated sprung portion of the vehicle.

3,893,703

AUTOMATICALLY DEPLOYED OCCUPANT RESTRAINT SYSTEM

John J. Chika, 1350 Orchard Ridge Rd., Bloomfield Hills, Mich. 48013

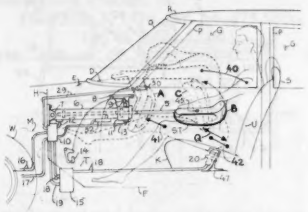
Filed Aug. 7, 1972, Ser. No. 278,559

Int. Cl. B60r *21/06*

U.S. Cl. 280—150 B **47 Claims**

1. In a safety device for protecting an occupant of a transportation vehicle seat including an occupant compartment defined by a seat and a rigid structure spaced adjacently to the seat, a protective element having a relatively narrow surface and a relatively wider surface portion, means including a supporting structure attached to the adjacent rigid structure of the compartment for adjustably supporting and automatically positioning the protective element in an active position in proximity to said seat with its wider surface portion substantially horizontal and extending in proximity to the occupant and transversely to and higher than the seat-cushion and removing it there-from to a stored away from the proximity to said seat, means tiltably connecting said protective element to said supporting structure for tiltable movement about an axis

transverse with respect to said seat whereby said wider surface portion of said protective element may be turned from said horizontal position to a position wherein it presents said wider surface portion toward the torso of the occupant of said seat when any forward pressure is exerted against the rear edge of said protective element as when the occupant moves forwardly as a result of any sudden deceleration of the vehicle and his torso is forced against said protective element,



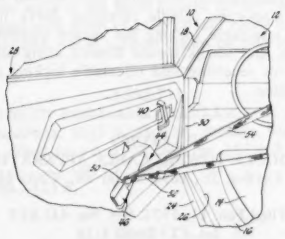
wherein said means for the automatic positioning of said protective element is controlled by two sensing means: a first one for sensing when said seat is occupied and second for sensing when said vehicle reaches predetermined forward speed, the two sensing means acting in sequence and being in series with each other effecting the actuation of said means for automatic positioning of said protective element into proximity of said seat only when both of them are actuated.

3,893,704

VEHICLE BODY OCCUPANT RESTRAINT BELT ARRANGEMENT INCLUDING DOOR MOUNTED BUCKLE

Charles H. Torner, Rochester, and Richard F. Carella, Mount Clemens, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 27, 1974, Ser. No. 510,123
Int. Cl. B60r *21/10*
U.S. Cl. 280—150 SB **5 Claims**



1. In a vehicle body including a door movable between open and closed positions laterally adjacent a seat and having a door lock for holding the door in closed position, a restraint belt arrangement for restraining an occupant of the seat, the belt arrangement comprising:

a restraint belt having one end secured adjacent an inboard portion of the seat and having a male latch member secured to the other end thereof;

a female buckle for selectively receiving and securing the latch member, the buckle being actuatable to release the latch member;

a slide assembly mounted on the door and supporting the buckle for movement between retracted and extended positions relative thereto, the retracted buckle being positioned in a lower rearward position relative to a seated occupant when the door is closed so that the buckle secures the latch member at a location positioning the restraint belt in an occupant restraining position across this occupant, the extended buckle being located upwardly and forwardly from the retracted buckle so as to be readily accessible to the seated occupant for receiving the latch member;

means on the slide assembly for normally biasing the buckle to the extended position so as to facilitate access of the occupant to the buckle for securement of the latch member thereto; and

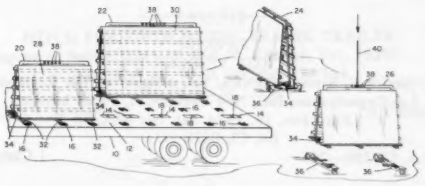
a releasable detent on the slide assembly for holding the buckle in the retracted position upon movement thereto so as to thereby secure the belt in the restraining position when the latch member is secured to the buckle, the detent being released to allow the buckle bias to return the buckle to extended position for convenient access to the occupant.

3,893,705

TRANSPORTABLE RACK CONSTRUCTION

Donald D. Allen, Pittsburgh, Pa., assignor to Cobbledick-Kibbe Glass Company, Oakland, Calif.

Filed Apr. 29, 1974, Ser. No. 465,043
Int. Cl. B60p *7/00*
U.S. Cl. 280—179 R **11 Claims**



1. A system for transporting flat glass from a distribution point to a dealer or job site, said system comprising:

a truck bed having at least one row of slots formed therein and a plurality of pins located in the respective slots, one of the pins at least partially spanning each of the slots;

a rack adapted to support a quantity of flat glass, said rack including a base portion adapted to be placed on the truck bed for transporting the glass thereon;

a pair of hooks, one hook disposed at each end of the base portion of the rack, said hooks adapted to selectively project downwardly into respective slots in the truck bed and releasably engage the pins associated with the respective slots to fix the rack to the truck bed for transportation of glass, said hooks being releasable from said pins to allow the rack containing the quantity of flat glass thereon to be removed from the truck bed; and

means for actuating the hooks so that said hooks project downwardly into respective slots in the truck bed, said actuating means including toggle locking means for locking the hooks in the engaged position.

3,893,706

RIDING TOY

Elmer R. Hagen, 230 W. Genesee St., Royal Arms, and Taras Hrynyk, 19 Richardson Ave., both of Auburn, N.Y. 13021

Filed May 22, 1974, Ser. No. 472,165
Int. Cl. A63g *15/00*
U.S. Cl. 280—207 **10 Claims**

1. A childs riding toy comprising:

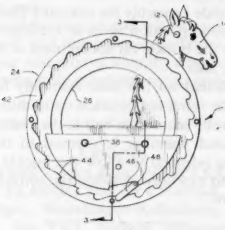
a. a seat portion disposed to support a rider;

b. a pair of coaxial wheels of equal diameter;

c. support means connecting said seat to said wheels for relative rotational movement therebetween; and

d. said seat, wheels and support means being relatively arranged so that a rider on said seat has a center of gravity

higher than the axis of said wheels, whereby shifting the rider's body forward and backward produces rotation of said seat; and



e. ratchet means connected between said support means and said wheels to transmit rotation of said seat in one direction through said support means to said wheels while allowing rotation of said seat and support means relative to said wheels in the opposite direction.

3,893,707

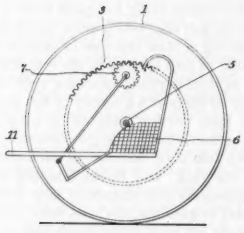
TOY VEHICLE

Frederick F. Samsel, Berwick, Pa., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Feb. 19, 1974, Ser. No. 443,356

Int. Cl. B62k 9/11

U.S. Cl. 280—208 **1 Claim**



1. A toy vehicle, comprising

a pair of wheels in spaced parallel relation each having an internally toothed annular member on the surface thereof facing the other;

an axle rotatably mounted in the wheels at the centers thereof;

a seat rotatably supported on the axle and hanging below the axle;

a pair of drive gears each drivably coupled to a corresponding one of the annular members;

hand crank means mounted on the seat and supporting the drive gears for rotation with the hand crank means formanually rotating the sheels, the hand crank means comprising a pair of hand cranks each independently rotatably mounted and each affixed to a corresponding one of the drive gears; and

rod means removably affixed to the front of the seat and extending beyond the rims of the wheels for halting rotation of the seat with the wheels upon rotation of the wheels with the drive gears fixed in position.

3,893,708

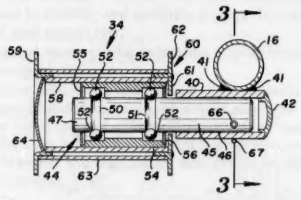
BEARING ASSEMBLY FOR WHEELCHAIR STRUCTURES

Richard D. Moroney, Bloomington, Minn., assignor to Theradyne Corporation, Jordan, Minn.

Filed Feb. 6, 1974, Ser. No. 439,873

Int. Cl. B62m 1/14

U.S. Cl. 280—242 WC **5 Claims**



1. In an invalid supporting wheelchair having frame means, seat means supported upon said frame means, and wheel receiving spindle means mounted upon said frame means, said wheel receiving spindle means comprising:

a. wheel supporting spindle receiving sleeve means rigidly mounted upon said frame means, a bearing assembly having a journal shaft spindle extending laterally therefrom and having the inner end thereof received within said sleeve means;

b. means arranged along said journal shaft spindle and adjacent the outer end thereof defining a pair of axially spaced inner bearing races;

c. bearing means disposed along said inner races and outer race means disposed radially outwardly of said bearing means and retaining said bearing means radially therewithin, said outer race means comprising a bearing means retaining sleeve with axially spaced outer bearing races;

d. wheel hub means comprising a central spindle receiving sleeve with hub flanges disposed at either end thereof and mounted radially outwardly of said bearing means and receiving said outer race means rigidly therewithin, and arranged to turn with said outer race means;

e. a generally radially extending bore formed within said wheel supporting spindle receiving sleeve means and having releasable locking pin means extending therethrough, and recess means formed along said journal means for receiving said releasable locking pin means therewithin.

3,893,709

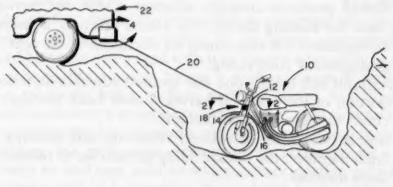
VEHICLE TOWING CABLE APPARATUS

Bernard H. Gertler, Jr., 1696 Samar Dr., Costa Mesa, Calif. 92626

Filed Feb. 11, 1974, Ser. No. 441,013

Int. Cl.[2] B60D 1/18

U.S. Cl. 280—292 **12 Claims**



1. A motorcycle towing apparatus comprising:

a cylindrical spindle;

a spool mounted for rotational movement on said cylindrical spindle;

a collar member for movement along the axis of said spindle to cause said spindle to be held in expanded relationship against the motorcycle fork member;

means for locking said spool against rotation; and,

a cable attached to said spool for rolled retraction thereon.

3,893,710

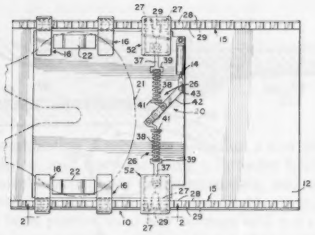
SLACK-FREE FIFTH WHEEL SLIDER

Francis Eli Madura, Whiting, Ind., assignor to Amsted Industries Incorporated, Chicago, Ill.

Filed June 3, 1974, Ser. No. 475,588

Int. Cl. B62d *53/06*

U.S. Cl. 280—407 **15 Claims**



1. A fifth wheel slider for adjustably positioning a fifth wheel on the frame of a tractor, said slider comprising a base plate adapted to be fixedly attached on a tractor, a pair of laterally spaced racks including a plurality of teeth having parallel side walls separated by spaces along the length thereof, fifth wheel support means mounted on said base for lengthwise movement and adapted to support a fifth wheel, latch means on said fifth wheel support means mounted for engagement with said rack teeth for retaining said support means fixed against lengthwise movement, said latch means including pairs of lengthwise spaced fingers have confronting tapered edges merging toward the inner end and parallel opposed edges disposable within the spaces and tapering to a width greater than the width of the space to wedgingly engage with the side walls of the teeth located on the opposite sides of one of said rack teeth of each of said racks to selectively position said fifth wheel support means on said base.

3,893,711

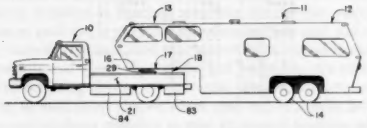
PICKUP TRUCK BODY AND COUPLER FOR TRAILERS

Frank E. Goodwin, 1015 N. 23rd St., Billings, Mont. 59101

Filed June 6, 1973, Ser. No. 367,465

Int. Cl.[2] B62D *53/06*

U.S. Cl. 280—423 R **7 Claims**



1. The combination of a truck and a recreational trailer having a forward portion overhanging the body of the truck and swivelly secured to the truck body,

said truck having longitudinal frame members, a rear axle secured thereto, and a truck body;

said truck body having a floor extending the full length of said truck body, a pair of enclosed wheel wells extending above the floor and into which the rear wheels of the truck can extend, and two narrow side body panels of a height above said floor substantially equal to that of said wheel wells so that the side panels of said truck body do not extend appreciably above the tops of said wheel wells, the tops of each of said wheel wells being relatively flat for a substantial portion of its length, said wheel wells extending lengthwise for only a portion of the length of said truck body,

a plurality of transverse beams secured to the underside of said truck body beneath said floor and resting upon said longitudinal frame members of the truck,

a first swivel coupling unit,

a support for said first swivel coupling unit,

means for supporting said coupling unit support above said floor between said wheel wells from at least two of said transverse beams,

said truck body providing a cargo carrying space above said floor between said side panels which extends the full length of said truck body and which cargo carrying space is relatively unobstructed except for the relatively short region occupied by said wheel wells, said first swivel coupling unit, and the supporting means therefor,

and said trailer having a forward portion overhanging the body of the truck and a second swivel coupling unit extending downwardly from said forward portion and swivelly coupled to said first swivel coupling unit to support said forward portion in a vertical position in which the bottom of said forward portion is as close to the tops of said wheel wells as it is to the tops of said side panels.

3,893,712

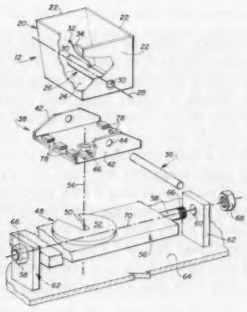
HITCH FOR FIFTH WHEEL TRAVEL TRAILER

Eugene A. Sallier, 2211 W. Oak St., Denton, Tex. 76201

Filed May 28, 1974, Ser. No. 473,564

Int. Cl. B62d *53/08*

U.S. Cl. 280—440 **6 Claims**



1. A hitch for connecting a fifth wheel travel trailer to a pickup truck which comprises:

a box frame depending from the frame of the travel trailer at the front end thereof and comprising side walls and a bottom wall;

a rod;

means supporting the rod on the box frame for pivotal movement about a longitudinal axis and comprising a sleeve mounted on the box frame and defining said longitudinal axis and having the rod pivotally received therein; a saddle mounted on the rod for pivotal movement about said longitudinal axis and comprising a bottom wall and side walls extending adjacent to and positioned outside of the side walls of the box frame;

the rod being secured to the side walls of the saddle so that the saddle pivots with the rod about the longitudinal axis; a king pin depending from the bottom wall of the saddle for engagement with latching apparatus mounted on the bed of the pickup truck to connect the travel trailer to the pickup truck; and

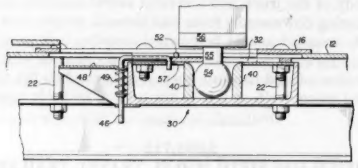
a plurality of resilient members mounted on the bottom wall of the saddle in engagement with the bottom wall of the box frame for regulating pivotal movement of the saddle about said longitudinal axis and thereby stabilizing the pivotal movement of the travel trailer relative to the pickup truck.

3,893,713

PICK-UP TRUCK COUPLER FOR GOOSENECK BALL TRAILER HITCHES

Charles D. Ivy, Rt. 5, Box 243, Monroe, La. 71201

Filed June 28, 1974, Ser. No. 484,114
Int. Cl.[2] B60D 1/06
U.S. Cl. 280—511 **2 Claims**



1. The combination with the load carrying bed of a truck having an opening formed in said bed over the rear axle thereof; of a bed plate covering said opening and fixed to said bed; said plate having a trailer hitch ball receiving coupler fixed to the bottom of the central area thereof and an access door formed therein; said coupler having a horizontally extending plate with a ball receiving opening therein; longitudinally extending guide members mounted on opposite sides of said opening; said plate including a lock receiving aperture; a planar horizontally moving locking slide movable in said guide members and having a key hole slot including a large opening for the reception of said ball and a smaller opening for engaging the neck of said ball to lock it in said coupler; and locking means connectable with said lock receiving aperture.

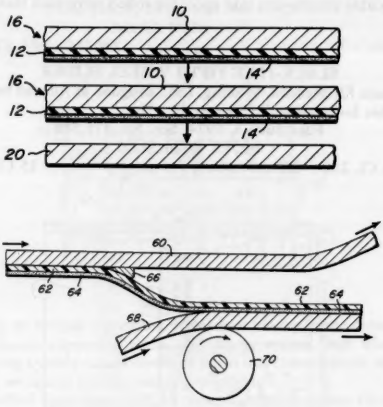
3,893,714

BUSINESS SHEET HAVING REMOVABLE TRANSFER MEANS AND METHOD OF MAKING

William T. Paulson, Kettering, Ohio; David M. Davidson, deceased, late of Dayton, Ohio, and by Clara A. Davidson, executrix, Dayton, Ohio, assignors to The Standard Register Company, Dayton, Ohio

Continuation-in-part of Ser. No. 156,704, June 25, 1971, Pat. No. 3,766,755, which is a continuation-in-part of Ser. No. 800,167, Feb. 18, 1969, abandoned. This application July 12, 1973, Ser. No. 378,546The portion of the term of this patent subsequent to Dec. 4, 1990, has been disclaimed.
Int. Cl. B41m 5/10
U.S. Cl. 282—28 R **11 Claims**

5. A method of producing a continuous business form article, comprising the steps of directing a continuous paper web from a supply roll to a plastics material coating unit, releasably coating a thin film of plastics material onto the web to form a film thickness less than 0.0005 inch, coating a layer of image transfer material onto at least a portion of said film, releasing the combined said film and layer of image transfer material from said web, and winding the assembly of the paper web, the



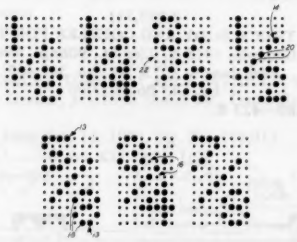
film of plastics material and the coating of image transfer material into a roll.

3,893,715

MATRIX FRACTION FONT

Gary R. Haak, Chicago, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Dec. 28, 1973, Ser. No. 429,338
Int. Cl. B42d 15/00
U.S. Cl. 283—1 R **10 Claims**



1. A font of numerical fraction-like figures for use with a character element printing system having a parallelogram-shaped major matrix of possible character-element positions, said major matrix having corners, including:

a first minor matrix of possible character-element positions located in a first corner of the major matrix;

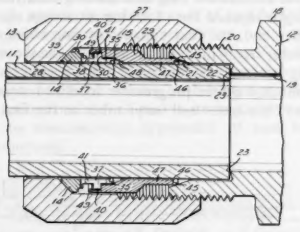
a second minor matrix of possible character-element positions located in a second corner of the major matrix diagonally opposite from the first corner; and

a discontinuous line extending generally between a third corner of the major matrix and a fourth corner of the major matrix.

3,893,716
FLARELESS FITTING

Luis Moreiras, Northfield, and Hiralal V. Patel, Euclid, both of Ohio, assignors to The Weatherhead Company, Cleveland, Ohio

Filed Apr. 1, 1974, Ser. No. 456,777
Int. Cl. F16l 19/06
U.S. Cl. 285—3 11 Claims

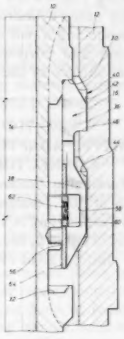


1. In combination, a tube, a body, a nut, a rear sleeve, and a front sleeve, said body including a threaded body portion and a conical internal body camming surface, said nut including a threaded nut portion for threadably engaging said threaded body portion to axially advance said nut relative to said body from a starting position to a midway position and from said midway position to a tightened position, and a nut abutment surface, said front sleeve being annular and being disposed between said rear sleeve and said body camming surface, said front sleeve including a front sleeve annular pilot at one of its ends and a conical internal front sleeve camming surface at its other end, said rear sleeve including a rear sleeve annular pilot at one of its ends and a rear sleeve abutment surface at its other end, a radially outwardly extending shear section means on one of said sleeves transmitting a force in the axial direction between said sleeves when said nut is axially advanced from said starting position to said midway position, said shear section means being frangible to render said shear section means abruptly inoperable to transmit said force when said nut is in said midway position, said front and rear sleeve pilots each being in a radially outward position and said nut abutment surface loosely engaging said rear sleeve abutment surface when said nut is in said starting position, said front sleeve pilot being radially inwardly contracted from said radially outward position by operation of said body camming surface and said rear sleeve pilot being in said radially outward position when said nut is in said midway position, said nut abutment surface exerting a predetermined force in the axial direction on said rear sleeve abutment surface when said nut is in said midway position, said predetermined axial force being equal to the shear force of said shear section means and said shear section means being abruptly broken and rendered inoperable to transmit forces in the axial direction when said midway position is reached whereby the torque required to advance said nut is abruptly decreased when said nut reaches said midway position, said rear sleeve pilot engaging said front sleeve internal camming surface and providing the sole means for transmitting forces in the axial direction from said rear sleeve to said front sleeve when said nut is axially advanced from said midway position to said tightened position whereby only said nut and said rear sleeve are axially advanced relative to said tube when said nut is advanced from said midway position to said tightened position, said rear sleeve pilot being radially inwardly contracted from said radially outward position by operation of said front sleeve internal camming surface when said nut is in said tightened position, said rear sleeve is axially slotted from said rear sleeve pilot, and said rear sleeve pilot is radially inwardly contractible by a substantially lesser axial force than said front sleeve pilot whereby said rear sleeve cannot push said front sleeve axially forwardly when said nut is advanced from said midway position to said tightened position.

3,893,717
WELL CASING HANGER ASSEMBLY

Norman A. Nelson, Houston, Tex., assignor to Samuel W. Putch, Houston, Tex., a part interest

Filed May 15, 1974, Ser. No. 465,028
Int. Cl.² F16L 37/08
U.S. Cl. 285—3 6 Claims



6. In an assembly for connecting first and second tubular members to and from each other in a well by longitudinal movement of the first member, said first member including an annular recess in its peripheral surface adjacent the second member, a radially extending stop shoulder on the first member at each end of the recess, a resiliently expandable and contractible locking means positioned in said recess and axially slidable therein between said stop shoulders, locking shoulder on the first member for locking said locking means in an expandable position, a locking notch on the second member in its peripheral surface adjacent the first member for receiving the expanded and locked locking means, the improvement comprising,

shearable holding means intermediate the ends of the resiliently expandable and contractible locking means said shearable holding means acting to prevent axial movement of said expandable and contractible locking means on the first member until said locking means engages said locking notch and the shearable holding means which when sheared by downward longitudinal movement of the first member allows the upper portion of the locking means to releasably lock the first anad second members together.

3,893,718
CONSTRICTED COLLAR INSULATED PIPE COUPLING

Jonathan S. Powell, 11 W. State St., Pasadena, Calif. 91105

Filed Nov. 23, 1973, Ser. No. 418,254
Int. Cl. F16l 11/12
U.S. Cl. 285—53 2 Claims

1. A constricted collar pipe coupling, comprising:

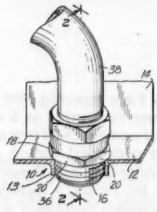
a. an inner sleeve of electrical insulating material having an external stop flange;

b. a pair of pipe ends initially fitted over the sleeve and abutting the stop flange;
c. an outer sleeve of electrical insulating material fitted over the pipe ends;
d. and a collar formed of mallable material having initially a cylindrical bore receiving the outer sleeve, pipe ends and inner sleeve;
e. said collar having, initially, a cylindrical outer surface interrupted by at least a pair of external flanges of uniform thickness overlying each pipe end;
f. said flanges being constricted to essentially the same dimension of the outer cylindrical surface of the collar therebetween producing a pair of undulated depressions in each pipe end and corresponding portions of the sleeves and inner surface of the collar.

3,893,719
LIQUID-TIGHT SWIVEL ADAPTOR FOR ELECTRICAL CONNECTOR

Jonah Eidelberg, Huntington Station, and Thomas Mooney, Mount Sinai, both of N.Y., assignors to Electrical Fittings Corporation, East Farmington, N.Y.

Filed Oct. 21, 1970, Ser. No. 82,557
Int. Cl. F16l *19/00*
U.S. Cl. 285—55 **7 Claims**



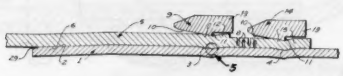
1. A swivel adaptor for coupling an electrical connector to a surface, comprising a tubular body having a bore therethrough and upper and lower portions, the upper portion having an outwardly directed flange and said body being outwardly flared proximate said flange, a resilient sleeve fixedly received within and abutting the surface defining the bore of said upper portion of said body, said sleeve protruding beyond the upper end of said body and positioned to engage the connector end in assembled condition and having its upper portion flexed radially inwardly by the connector end when said connector is in assembled position and said sleeve having an outwardly flared portion being forced against said body flared portion, connector coupling means for maintaining said body, connector and sleeve in assembled sealing relation and including a nut with an inwardly directed collar portion adapted to slidably fit said body upper portion and engage said flange when in connector assembled tightened condition, the inner and outer peripheral end surfaces of said connector being engaged respectively by the end peripheral faces of said sleeve and body upper portion, and means for sealingly mounting said adaptor to said surface.

3,893,720
CONSTRICTOR RING JOINT

Kurt O. Moebius, P.O. Box 2339, Palos Verdes Peninsula, Calif. 90274

Filed Feb. 9, 1973, Ser. No. 331,319
Int. Cl. F16l *13/14*
U.S. Cl. 285—187 **4 Claims**

1. A connector comprising:
a. an inner tube having an external cylindrical portion;
b. an outer tube having outer cylindrical surfaces and an internal cylindrical portion telescopingly received over the external cylindrical portion of the inner tube;
c. the outer tube having axially inward of its extremity, a first zone of greater wall thickness and external cylindrical diameter, and having at its extremity, a second zone of lesser wall thickness and external cylindrical dimension;
d. a first constrictor ring surrounding said first zone and having a tapered bore forming an abrupt shoulder at its smaller end, the first constrictor ring being of an inner diameter freely movable axially over the second zone and being internally dimensioned in the region of its shoulder to directly effect progressive localized constriction of both of the inner and outer tubes as the first constrictor

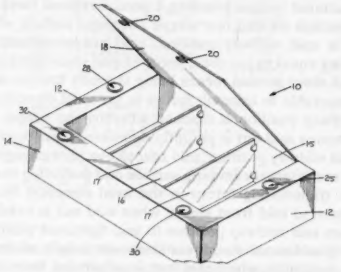


ring is moved axially along the first zone thereby to form a first mechanical bond and seal between the tubes within the first zone;
e. a second separate constrictor ring surrounding said second zone and having a tapered bore and abrupt shoulder at its smaller end, the second constrictor ring being internally dimensioned in the region of its shoulder to directly effect progressive localized constriction of both the outer tube and inner tube as the second constrictor ring is moved axially along the second zone thereby to form a second mechanical bond and seal between the tubes within the second zone;
f. one of the tubes including between the first and second constrictor rings a set of corrugations to permit relative axial expansion and contraction of the tubes while maintaining intact the bonds and seals between the tubes.

3,893,721
MEDICINAL SAFETY CABINET

Harry F. Upton, Ridgewood, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Nov. 23, 1973, Ser. No. 418,677
Int. Cl. E05c *19/10*
U.S. Cl. 292—30 **7 Claims**



1. An enclosure fitted with a closure secured in the closed position by a latch means;
means for releasing said latch; and
actuating means for operating said latch release means;
said actuating means comprising;
1. first and second sets of push-buttons, each set consisting of two push-buttons and each push-button within a

set being spaced from the other push-button a distance greater than the average span between the thumb and any one of the remaining fingers of the hand of a child, but less than the average span between thumb and any one of the remaining fingers of an adult; each of the push-buttons of said first set being located a distance from each of the push-buttons of said second set greater than the average span between thumb and any one of the remaining fingers of a child but less than the average span between the hands of an adult when held in a position of maximum separation;

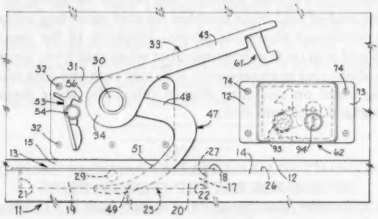
2. means for blocking operation of one of each of said first and second sets of push-buttons, said means being connected to the remaining push-button of each of said first and second sets of push-buttons and being removable by simultaneous depression of said remaining push-buttons.

3,893,722

LATCH AND LOCK STRUCTURE

Gerald W. Galbreath; Alfred T. Dietrich, and George E. Mosbarger, all of Marion, Ohio, assignors to Overhead Door Corporation, Dallas, Tex.

Filed Nov. 1, 1973, Ser. No. 411,802
Int. Cl.[2] E05C *3/16*
U.S. Cl. 292—100 **3 Claims**



1. In combination, a truck van having a door frame defining an access opening into the interior of said van, a door movably supported on said van and having interior and exterior surfaces, said door being positionable in a closed position wherein it closes said access opening and being movable upwardly into an open position, catch means mounted on the bed of said van, and latch means movably mounted on said door adjacent said exterior surface and coacting with said catch means for holding said door in said closed position, said latch means including a hook-shaped latch bolt swingably mounted on said door and releasably engageable with said catch means, said latch means further including an elongated actuating handle pivotally supported on said door for swinging movement about a pivot axis and coacting with said latch bolt for controlling the movement thereof, said actuating handle being pivotally movable relative to said door between latched and unlatched positions, the improvement comprising:

bracket means fixedly mounted on said door adjacent the exterior surface thereof and projecting outwardly therefrom, said bracket means comprising a boxlike casing cooperating with said exterior surface to define a substantially closed compartment therebetween, said compartment being totally closed except for an opening formed in the top wall of said casing;

said casing also having a front wall which is spaced outwardly from and is substantially parallel to the exterior surface of said door;

said actuating handle having a recessed portion defining a recess therein, the recessed portion of said handle comprising a C-shaped portion fixedly connected to said handle adjacent the free end thereof and defining said recess which extends radially with respect to said pivot axis, the bight and the lower leg of said C-shaped portion projecting through said opening and being totally enclosed within said compartment when said handle is in said latched position, the upper leg of said C-shaped portion abutting the top wall of said casing and overlapping said opening for closing same, whereby said compartment is totally closed when the handle is in said latched position;

lever means disposed within said compartment and pivotally mounted relative to said bracket means, said lever means having a projection means fixedly mounted thereon and disposed for movement between locked and unlocked positions responsive to swinging movement of said lever means, said projection means being disposed within said recess when said projection means is in said locked position and said actuating handle is in its latched position for positively preventing material movement of said handle away from said latched position;

resilient means coacting with said lever means for yieldably urging said lever means in a direction whereby said projection means is automatically moved into said locked position; and

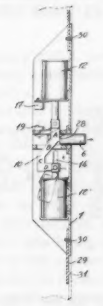
key-operated release means mounted upon said bracket means and engageable with said lever means for pivoting said lever means so that said projection means is moved from its locked position into its unlocked position, said key-operated release means being operated solely by a key and being the sole means for permitting movement of said lever means away from its locked position so as to release said actuating handle, said key-operated release means including a rotatable lock cylinder disposed within said compartment for rotation about an axis which is substantially perpendicular to the front wall of said casing, said lock cylinder being rotatably mounted solely on said front wall and having the key-receiving end thereof projecting through said front wall.

3,893,723

ELECTROMAGNETIC DOOR LOCK

Esdras Boule, 1160 Armand St., Drummondville, Quebec, Canada

Filed Jan. 31, 1974, Ser. No. 438,380
Int. Cl.[2] E05B *47/02*
U.S. Cl. 292—140 **9 Claims**



1. An electrically operated door lock comprising:

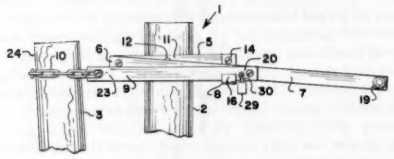
a. a housing for mounting the door lock and having a bore on one side thereof;

b. a locking pin having a longitudinal axis, said locking pin being disposed in said bore for axial movement therein;

c. a lock operating mechanism mounted in said housing, said mechanism including a first electromagnetic means for driving said locking pin through said bore into a lock position and a second electromagnetic means for driving said pin into an unlock position;

d. a guiding member extending through the locking pin and adapted upon actuation of said first and second electromagnetic means to lead said pin into the lock and unlock positions, respectively;
e. said guiding member including first, second, and third sections;
f. said first section having a centerline which is perpendicular to the longitudinal axis of said locking pin;
g. said second section including a segment having a centerline which is inclined at an angle of approximately 30°–60° with respect to the centerline of said first section, said second section extending between said first and third sections to join said first, second, and third sections together;
h. said third section extending from said section and having a centerline which is substantially perpendicular to the centerline of said first section;
i. said first electromagnetic means being coupled with a distal end of said first section;
j. said second electromagnetic means being coupled with a distal end of said third section;
k. said locking pin including a passage, said passage being partially defined by first, second, and third surfaces, said first and second surfaces being parallel to each other and parallel to said inclined centerline of said segment of said second section of said guiding member, said third surface joining said first surface and being disposed perpendicularly to the longitudinal axis of said locking pin and parallel to the centerline of said first section;
l. said inclined segment of said second section of said guiding member engaging said first surface when said locking pin is driven from the unlock position into the lock position, said inclined segment engaging said second surface when said locking pin is driven from said lock position to said unlock position, said first section of said guiding member engaging said third surface in abutting relationship therewith when said locking pin is in the lock position to thereby maintain said locking pin in such position until it is driven therefrom by said electromagnetic means.

3,893,724
GATE LOCKING DEVICE
Frederick A. Reinfeld, 137 N. 69 Highway, Liberty, Mo. 64068
Filed Feb. 28, 1974, Ser. No. 446,637
Int. Cl.² E06B *3/80*
U.S. Cl. 292—247 **2 Claims**



1. A gate locking device for use with a fence gate, having a plurality of spaced wires connecting a post at one side of a gate opening and a gate end member with the wires being of a length that the gate extends substantially across the gate opening, said gate locking device comprising:
a. an elongated mounting member secured to a generally upstanding fence post and positioned adjacent a top thereof in a substantially level position, said fence post being at the other side of a gate opening, said mounting member being substantially normal to the fence post and having an upwardly opening generally U-shaped stop mounted adjacent one end thereof in depending relation thereto;
b. an elongated lever member having one end thereof pivotally mounted on the other end of said mounting member, said lever member being movable between a position depending from the other end of said mounting member and a position above and in engagement with said stop, said lever member having a handle on the other end thereof;
c. an arm having one end thereof pivotally mounted on said lever member at a point intermediate the ends of said lever member, said arm being movable with said lever member;
d. a flexible means on the other end of said arm movable over and engageable with an upper end portion of an end member of a fence gate having a lower end portion thereof retained in a position adjacent the fence post for moving the upper end portion of the end member toward the fence post upon movement of said lever member and arm toward and into engagement with said stop and for holding the upper end portion of the end member adjacent the stationary fence post;
e. said stop extending outwardly from adjacent the one end of said mounting member and being adapted to support thereon said lever member and said arm when in gate closing position;
f. said stop being positioned between the one end of said arm and the one end of said lever member when said lever member is above and in engagement with said stop; and
g. said stop being positioned below the other end of said mounting member whereby the pivotal mounting of the one end of said lever member on said mounting member is positioned above the pivotal mounting of the one end of said arm on said lever member when said lever member is above and in engagement with said stop and gate retaining force on said arm acts to retain the lever member engaged with said stop.

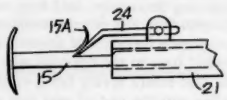
3,893,725
DEVICE FOR LATCHING CONTAINERS
Glenn A. Coulter, and Thomas L. Coulter, both of 3113 Norris Cr., Columbus, Ga. 31907
Filed Feb. 25, 1974, Ser. No. 445,461
Int. Cl. B65d *51/100, 45/08*
U.S. Cl. 292—258 **7 Claims**

1. A latching device for both securely retaining the cover of a container in place and providing for quick removal of said cover from said container, comprising:
a container having a pair of straps, each of which is secured at one end thereof to opposite sides of said container;
a pad of separable pile fastener material firmly affixed adjacent the other end of each strap; and
a cover having a pair of pads of separable pile fastener material firmly affixed to the cover, wherein said separable pile fastener material affixed to said cover complements the material affixed to the straps so that the straps retain the cover on the container when the material affixed thereto is pressed into engagement with the material affixed to the cover.

3,893,726
SHOCK ABSORBER VEHICLE BUMPER

Clayton B. Strohschein, Channelview, Tex., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Apr. 1, 1974, Ser. No. 456,749
Int. Cl. B60r *19/04*
U.S. Cl. 293—1 **1 Claim**



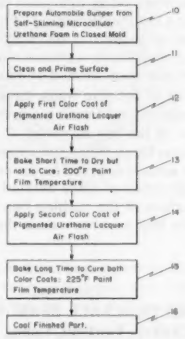
1. A vehicle bumper mechanism for the reduction of collision forces on a protected vehicle to which the bumper mechanism is mounted, comprising a

vehicle bumper mounted on a support member, said support member being in longitudinal telescopic engagement with a chassis support member of the attached vehicle, said bumper support member fitted with means for extending the bumper away from the attached vehicle, prior to a collision, together with shear knife means fitted on the chassis support member for shearing a lamina of the bumper support member when the bumper support member is driven back abruptly towards the chassis support member by the impact of a collision, in which the shear knife means positions the shear knife to shear a variable thickness of bumper support member, with the thickkness of the sheared lamina being proportional to the rate of deceleration of the attached vehicle.

3,893,727
TWO-TONE PAINTING OF FLEXIBLE URETHANE FOAM AUTOMOBILE EXTERIOR PARTS

Kenneth G. Desilets, Dover, N.H., assignor to McCord Corporation, Detroit, Mich.

Filed Oct. 30, 1973, Ser. No. 411,046
Int. Cl. B60r *19/08;* **B32b** *27/40*
U.S. Cl. 293—71 R **4 Claims**


Prepare Automobile Bumper from Self-Skinning Microcellular Urethane Foam in Closed Mold
10
Clean and Prime Surface
11
Apply First Color Coat of Pigmented Urethane Lacquer Air Flash
12
Bake Short Time to Dry but not to Cure 200°F Paint Film Temperature
13
Apply Second Color Coat of Pigmented Urethane Lacquer Air Flash
14
Bake Long Time to Cure both Color Coats: 225°F Paint Film Temperature
15
Cool Finished Part.
16

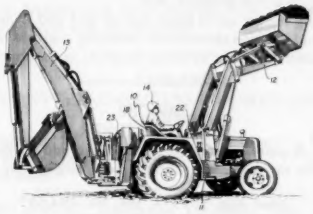
2. In the finishing of the surface of an automobile exterior part of a self-skinning microcellular urethane foam with a well adhered flexible, extensible, and pigmented top coat having thermo-setting resin vehicle requiring heating to a cure temperature to cure, wherein said automobile exterior part after application of said top coat is baked at an ambient temperature substantially in excess of said cure temperature for a substantial period of time; the improvement permitting two-tone finishing of said article with minimum degradation of said microcellular urethane foam, comprising in combination the steps of:

1. Applying a first paint coat 0.8 to 3 mils thick, dry basis, to said surface composed of:
   a. a thermosetting polyester-extended melamine resin vehicle
   b. pigment
   c. solvent
   d. a cure catalyst for said vehicle in an amount substantially greater than that, if any, contained in a second paint coat, described in step 3, as an aid in controlling the extent of partial cure of said first paint coat;
2. Baking the thus coated article for a short period of time to dry but not completely cure said first paint coat;
3. Immediately applying to said surface said second paint coat 1 to 4 mils thick, dry basis, composed of:
   a. a thermosetting polyester-extended melamine resin vehicle
   b. a pigment substantially different from the pigment of step 1
   c. a solvent;
4. And baking the thus twice coated article for a substantial period of time at an oven temperature in excess of said cure temperature to cure both said first and second paint coats.

3,893,728
MATERIAL HANDLING APPARATUS

Vaino J. Holopainen, East Sullivan, N.H. 03445

Filed Nov. 19, 1973, Ser. No. 416,829
Int. Cl. B60n *1/02*
U.S. Cl. 296—65 R **11 Claims**



1. Material handling apparatus, comprising:

a. a vehicle body having a substantial horizontal deck longitudinally of the body,

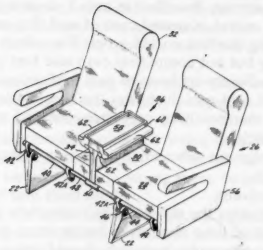
b. a pair of spaced, parallel fenders extending longitudinally of the body, one fender being located on each side of the deck,

c. a seat mounted above the deck between the fenders,

d. a support arm pivoted at one end to a fender for swinging movement through an angle of approximately **90°** in a horizontal plane below the level of the bottom of the seat, the other end of the arm being pivotally attached to the bottom of the seat at the center front thereof, and

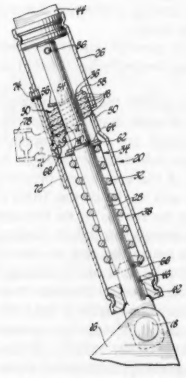
e. means to cause the seat to rotate through an angle of 180° when the arm swings through its angle of 90°, the means also serving to cause the seat to move a substantial distance longitudinally as it pivots through its angle of 180° from a forwardly-directed position were the operator has access to the driving controls of the vehicle to a rearwardly-directed position where the operator has access to handling controls of the vehicle, the means consisting of a control arm pivotally connected at one end to the same fender to which the support arm is pivoted, but at a point spaced forwardly a substantial distance from the connection of the support arm, the other end of the control arm being pivotally connected to the bottom of the seat at the center of one side.

3,893,729
CONVERTIBLE PASSENGER SEAT
Gale K. Sherman, Tustin, and Guy A. Smith, Newport Beach, both of Calif., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.
Filed Nov. 18, 1974, Ser. No. 524,385
Int. Cl.[2] A47C 13/00
U.S. Cl. 297—118 8 Claims



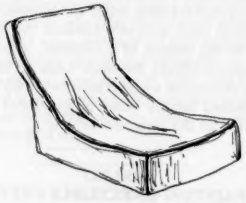
1. A convertible passenger seat comprising a two-seat unit having an extensible seat bottom frame removably attachable to a pair of seat supports remaining in spaced relationship;
said seat bottom frame comprising an I-shaped central member and a pair of U-shaped end members, the legs of which are telescopically engageable with said central member;
fastening means on said end members at a first position thereon for fastening said end members to said seat supports in a first position; and
fastening means on at least one of said end members at a second position thereon for fastening said one of said end members to one of said seat supports in a second position.

3,893,730
SEAT POSITIONER
Robert I. Homier, Farmington, and Raymond C. Posh, Livonia, both of Mich., assignors to Lear Siegler, Inc., Detroit, Mich.
Filed Aug. 5, 1974, Ser. No. 494,687
Int. Cl. B60n 1/06
U.S. Cl. 297—375 15 Claims



1. Seat positioning mechanism comprising: a pair of elongated members slidably connected for telescopic movement between extended and retracted positions with respect to each other; friction lock means carried by one of said members; said friction lock means having a lock position in frictional engagement with the other of said members to frictionally restrain said members in any selected position between said extended and retracted positions against relative movement with respect to each other, and an unlock position to permit free relative movement of said members; and locking and biasing means interconnecting said friction lock means and said other member; said locking and biasing means including a return spring and a plunger; said plunger having a base and arm means projecting therefrom, said base extending transversely of the longitudinal axis of said members and engaging said friction lock means on one side thereof, said arm means extending from said base to the opposite side of said friction lock means, and said return spring being connected between said other member and the end of said arm means opposite said base to resiliently urge said members toward the retracted position and said friction lock means toward its lock position.

3,893,731
ADJUSTABLE COUCH WITH ACOUSTICAL HEAD REST
Richard G. Maggs, 4050 La Junta Dr., Claremont, Calif. 91711
Filed Oct. 9, 1973, Ser. No. 404,266
Int. Cl. A47c 7/2, 7/14
U.S. Cl. 297—456 3 Claims

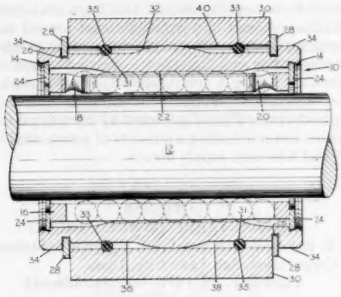


1. A couch structure, comprising:
a. a bag member including side walls of greater dimension at their central portions and lesser dimension at their end portions, and a botton wall, back wall, end walls and top wall of essentially uniform width;
b. mobile pellets contained in the bag member;
c. the bag member being dimensioned to receive a person thereon, and the mobile pellets being responsive to body pressure so as to permit the upper surface of the bag member to conform to a person supported thereon;
d. a head rest extension formed by an end wall and adjacent end portions of the side walls, back wall and top wall of the bag member and forming a compartment exposed to the interior of the bag member;
e. and a cushion block filling the compartment and presenting an end surface exposed to the mobile pellets whereby a varying direction of force exerted by the pellets against the end surface of the cushion block due to body movement on the bag member causes the head rest to tilt as a unit.

3,893,732
ANTI-FRICTION BALL BEARING ASSEMBLY
Albert R. McCloskey, Fairfield, Conn., assignor to Rockwell International Corporation, Pittsburgh, Pa.
Filed Mar. 18, 1974, Ser. No. 451,864
Int. Cl.[2] F16C 29/06
U.S. Cl. 308—6 C 7 Claims

1. An anti-friction ball bearing assembly, adapted for mounting within a housing comprising an outer sleeve and an inner sleeve concentrically fitting within said outer sleeve, said inner sleeve having a number of tracks defining paths for the circulation of balls between said sleeves and said shaft during movement between said shaft and said bearing assembly, said

balls, during a portion of their circulation path, contacting said shaft and the inner surface of said outer sleeve at a plurality of raceway surfaces provided thereon, said outer sleeve having a spherical seat on its outer surface and integral thereto



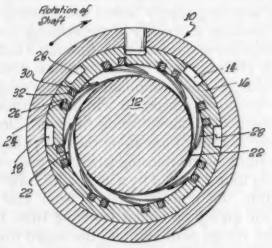
to accommodate misalignment between said housing and said shaft, a resilient 0 ring disposed at least one side of said spherical seat to resiliently restrain the movement of said ball bearing assembly on said spherical seat.

3,893,733

FOIL BEARING ARRANGEMENTS

Alexander Silver, Tarazana, and Johan A. Friedericy, Palos Verdes Estates, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Dec. 13, 1972, Ser. No. 314,890
Int. Cl. F16c *17/16*
U.S. Cl. 308—9 **6 Claims**



1. A hydrodynamic fluid bearing comprising:

first and second bearing elements movable with respect to each other and spaced apart to form a fluid gap therebetween;

at least one bearing foil attached to one of said bearing elements said foil loosely conforming to the shape of said bearing elements;

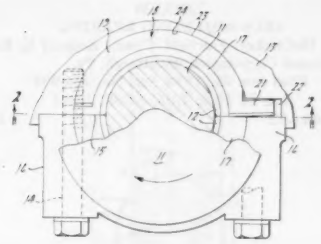
foil stiffening means attached to one of said bearing members and contacting said bearing foil at at least one point for increasing the effective stiffness of said bearing foil, said foil stiffening means comprising a generally U-shaped member attached to one of said bearing means at the closed end of said member and the bifurcated open ends being in contact with said bearing foil.

3,893,734

THRUST BEARING

Dieter Ulbrich, Cologne, Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 1, 1974, Ser. No. 457,048
Int. Cl.[2] F16C *9/02*
U.S. Cl. 308—23 **10 Claims**



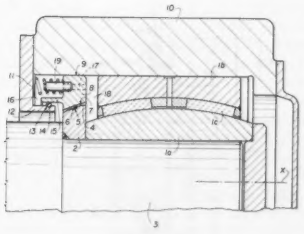
1. Internal combustion engine structure including an engine block having crankshaft support means, a crankshaft mounted within said support means to rotate about a given axis, thrust bearing means separating axially adjacent parallel surfaces on said crankshaft support means and on said crankshaft, said adjacent surface on said bearing support means comprising an annular seat, said thrust bearing means including a partial annulus positioned between said adjacent surfaces, said bearing including a tang protruding from one end of said partial annulus positioned between and engaging said adjacent surfaces, a recess formed in said crankshaft support means adjoining said annular seat, said tang being received within said recess to prevent said thrust bearing from angular displacement relative to said annular seat.

3,893,735

RESILIENT SEALING MEANS FOR SELF-ADJUSTING BEARINGS

Adolf Brenner, Schweinfurt, Germany, assignor to SKF Industrial Trading and Development Company, B.V., Amsterdam, Netherlands

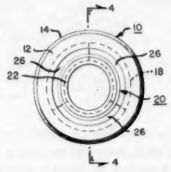
Filed Sept. 6, 1973, Ser. No. 394,667
Claims priority, application Germany, Sept. 16, 1972, 7234157
Int. Cl. F16c *23/04*, *33/74*; **F16j** *15/54*
U.S. Cl. 308—36.1 **7 Claims**



1. A spherically adjustable bearing having a body, an inner and outer race ring mounted therein, sealing means for axially closing one end of said bearing comprising a pair of concentric sealing discs, one of which being axially movable with respect to the other, said discs having cooperating surfaces and means acting in conjunction with said surfaces to provide a first seal therebetween, said movable sealing disc having an axial flange extending away from the one end of said bearing, a locking ring for supporting said movable sealing disc, said locking ring

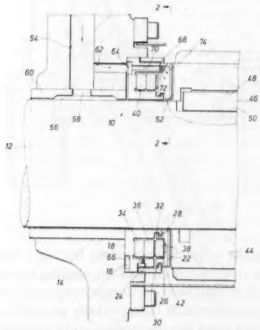
being secured to said body and having an axial flange extending adjacent the axial flange of said movable disc, spring means interposed between said locking ring and said movable disc to normally bias said movable disc with respect to the other disc, and means interposed between the extending flanges of said locking ring and said movable disc to form a second seal for said movable disc.

3,893,736
SELF-ADJUSTING BEARING
Albert R. McCloskey, Fairfield, Conn., assignor to Rockwell International Corporation, Pittsburgh, Pa.
Filed Jan. 21, 1974, Ser. No. 434,934
Int. Cl. F16c *9/06, 23/08, 27/04*
U.S. Cl. 308—72 **1 Claim**



1. A spherical bearing assembly having an inner race member and an outer race member, the inner surface of the outer race member having a concave spherical surface, the outer surface of the inner member having a complimentary convex spherical surface, said inner member having a unitary spool member, at least three spherical segments interlocked in an axial direction on said spool member, said spool member has two annular lips one disposed at each end thereof, said annular lips maintaining said segments on said spool so as to mechanically interlock them on said spool member when said inner member is in its operational position, said annular lips of said spool member have an outer surface which is a chordal section, subtending the convex spherical surface of said inner member.

3,893,737
THRUST BEARING HAVING LUBRICATION SYSTEM
Leonard L. Tyson, Houston, Tex., assignor to Marchem Resources, Inc., Houston, Tex.
Filed Apr. 19, 1974, Ser. No. 462,243
Int. Cl. F16c *17/06, 17/08*
U.S. Cl. 308—160 **20 Claims**



1. A lubricated self-leveling thrust bearing construction capable of sustaining thrust loads applied thereto by a rotatable shaft, said thrust bearing construction comprising:

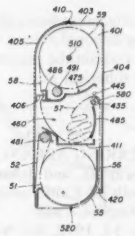
rotatable thrust force applying means being disposed in fixed relation to said rotary shaft;

thrust pad means being disposed in movable but non-rotatable position relative to said rotatable shaft and being disposed to receive thrust loads applied thereto by said rotatable thrust force applying means;

lubricant supply means for maintaining a hydrodynamic film of lubricant between said thrust pad means and said thrust force applying means, said lubricant supply means directing at least one jet of lubricant toward said thrust force applying means and causing said jet of lubricant to impinge upon said thrust force applying means, said jet of lubricant having a component of direction that opposes the direction of lubricant flow that is induced to said hydrodynamic film of lubricant by centrifugal force; and

means communicating a quantity of pressurized lubricant to said lubricant supply means.

3,893,738
RETRACTABLE TOWEL CABINET
Erwin B. Bahnsen, Oak Brook, Ill., assignor to Steiner American Corporation, Salt Lake City, Utah
Filed Apr. 30, 1973, Ser. No. 356,042
Int. Cl. B65h *19/00*
U.S. Cl. 312—38 **9 Claims**



1. In a toweling dispenser of the continuous type having a housing with a loop of toweling that extends along an exit path from a clean toweling supply within the housing and into an exposed use position exteriorly of the housing accessible to a user and thence along a return path through a soiled toweling accumulation chamber to a soiled toweling storage position within the housing, the combination comprising dispensing mechanism operatively disposed within the housing for dispensing a length of clean toweling from the clean toweling supply into the toweling loop along the exit path and into use position exteriorly of the housing when the accessible portion of the toweling loop is pulled by a user, a lift roller operatively disposed within the housing spaced from said dispensing mechanism for taking up soiled toweling from the toweling loop along the return path and into the soiled toweling accumulation chamber, a spring driven motor operatively mounted in said housing and operatively connected through a clutch to said lift roller, collecting mechanism operatively associated within the housing for taking soiled toweling from the soiled toweling accumulation chamber into the soiled toweling storage position within the housing, drive mechanism operatively interconnecting said dispensing mechanism and said collecting mechanism and said motor, and time-stop mechanism operatively connected to said dispensing mechanism and said clutch for controlling the time interval between successive operations of said dispensing mechanism and for controlling said clutch, means within said drive mechanism causing said collecting mechanism during operation of said dispensing mechanism to operate to take toweling from the soiled toweling accumulation chamber into the soiled toweling storage position and causing said spring motor to be wound so that operation of said clutch by said time-stop mechanism causes said motor to drive said lift roller to take up all slack in the

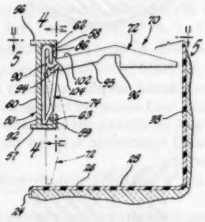
toweling between the clean toweling supply and said lift roller and to deposit same in the soiled toweling accumulation chamber, means operatively connected within said dispensing mechanism and said drive mechanism and said motor whereby successive operations wind said spring motor to a predetermined extent to insure the trailing end of the clean toweling is pulled into the soiled towel accumulation chamber.

3,893,739

RETAINER FOR REFRIGERATOR SHELF

James A. Bernard, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 24, 1974, Ser. No. 517,455
Int. Cl.[2] A47D *73/00*; **A47F** *5/13*
U.S. Cl. 312—138 A **2 Claims**



1. In a refrigerator door of the type having a recess therein for the storage of foodstuffs, a shelf construction comprising a horizontal surface for supporting objects, a shelf guard extending across the recess above the shelf surface; said shelf guard having vertically opposed longitudinally extending upper and lower grooves on the inner surface thereof facing said recess, a retainer assembly mounted on said guard, said assembly including a finger member and an integral wire hinge and torsion spring having a generally inverted U-shaped configuration, said spring having its lower portion disposed in said bottom groove and its upper portion disposed in said upper groove, said spring including a cross bar resiliently biased to a first overcenter position outward from the inner face of said guard, the upper portion of said U-shaped spring bent inwardly to provide axially aligned opposed pintles, said finger member having aligned bores in one end receiving respective pintles so as to rotatably support said finger member for substantially right-angled pivotal movement about a horizontal axis from a downwardly extending vertical retracted position to a horizontal position extending normally from the rear face of said shelf guard, said finger member having a transverse groove formed in the under surface thereof receiving said cross bar, whereby said U-shaped retainer assembly being slidably movable in said grooves when said retainer is in its retracted position snapping said cross bar to a second overcenter position adjacent the guard inner face, and whereupon said finger member being rotated to its horizontal position said cross bar is snapped to its first overcenter position biasing said finger member into contact with said upper return flange such that said finger member is retained in its horizontally extending position adjacent a tall container to prevent same from tipping over when the door is closed.

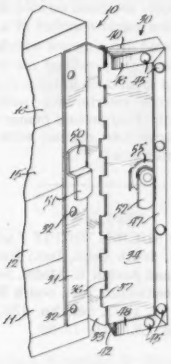
3,893,740

LOCKING DEVICE FOR A MULTI-DRAWER CABINET

William G. England, Elmhurst, Ill., assignor to Bretford Manufacturing, Inc., Schiller Park, Ill.

Filed Jan. 2, 1974, Ser. No. 430,179
Int. Cl.[2] E05B *65/46*
U.S. Cl. 312—216 **3 Claims**

1. A locking device for a multi-drawer cabinet having a structural frame mounting a plurality of vertically stacked drawers individually movable forwardly to an open position, comprising: an elongate mounting plate having a relatively narrow width for attachment to a part of the structural frame laterally adjacent said drawers; a flange on said mounting plate extending outwardly from an edge of said mounting plate and spaced laterally from said drawers; an upright locking bar having a length to cover a forward portion of each of the number of drawers that are to be locked against movement and pivotally connected at an edge thereof to an edge of said



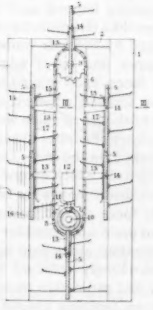
outwardly extending flange of said mounting plate for pivotal movement between an inactive position out of the path of movement of said drawers and a drawer locking position in front of said drawers, said locking bar in drawer locking position and said flange afford a lock protecting chamber with said mounting plate; and keyoperated lock means including coacting elements on said mounting plate and locking bar positioned entirely within the chamber for holding said locking bar in drawer locking position.

3,893,741

DISPLAY DEVICE

Jean Francois Schick, 7 rue de la Chaise, Paris, France

Filed May 10, 1974, Ser. No. 468,655
Claims priority, application France, Nov. 28, 1973, 73.42284
Int. Cl.[2] A47B *49/00*
U.S. Cl. 312—268 **6 Claims**



1. A moving display for exhibiting objects, comprising a frame having a first and an opposite second side each provided with an aperture; drive means for moving the objects to be exhibited intermediate said sides and in a closed path having

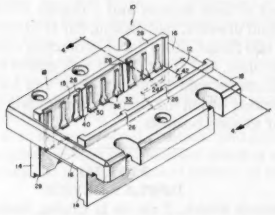
an ascending and a descending portion inwardly of the respective apertures; a plurality of vertically oriented panel members each having opposite planar surfaces and being driven by said drive means, said planar surfaces of each of said panel members facing said first and second sides, respectively; projecting elements mounted on said planar surfaces for supporting the objects to be displayed; and a plurality of mounting arms extending transversely of said sides and each having a first end portion pivotally supporting one of said panel members, a second end portion fixedly mounted on said drive means, and supporting the respective panel member at a predetermined distance outwardly of said drive means which is sufficient so that the projecting elements provided on respective panel members located in said ascending and descending portions of said path are free from interference with one another, whereby the objects supported on said planar surfaces of said panel members can move into register with the respective apertures without interference.

3,893,742

CARRIER FOR MICROCIRCUIT PACKAGES

Kenneth E. Blanchard, South Bend, Ind.; Kenneth R. Hook, West Trenton, N.J., and Arthur R. Midili, South Bend, Ind., assignors to Wells Electronics, Inc., South Bend, Ind.

Filed Nov. 29, 1973, Ser. No. 420,209
Int. Cl. H01r *13/60*
U.S. Cl. 339—119 R **5 Claims**



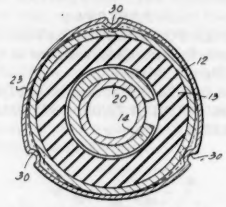
1. A carrier for a dual-in-line integrated circuit package, said package having a body defined in part by opposite first and second side faces and interconnecting side edges, said side edges each carrying a plurality of spaced transverse leads having free ends projecting beyond said first side face, said carrier comprising a box-like structure having a vertical opening therethrough defined by two side walls and two end walls extending between upper and lower edges, said side walls having opposed inner faces, each inner face having shoulder means formed thereon located adjacent one of said carrier edges, each inner face of the carrier side walls carrying protrusion means located between the other of said carrier edges and the shoulder means formed on the inner face, each protrusion means forming a part of a rib which extends toward said other carrier edge, each protrusion means for adjacently overlying the second of the side faces of said package body with said carrier being supported upon said shoulder means and the free ends of said leads extending along said inner faces whereby said package is interlockingly retained within said carrier between said shoulder and projection means, each rib including an inner face means tapering toward said other carrier edge to define a camming surface over which said package body slides as said body is pressed into said carrier opening from said other carrier edge, said carrier end walls having sufficient flexibility to accommodate movement of the side walls as the package body is urged into said carrier opening and over said rib face means until said package engages said shoulder means.

3,893,743

SOLID SHELL PHONOCONNECTORS

William H. Wallo, Clearwater, Fla., assignor to Perfection Enterprises, Inc., Chicago, Ill.

Filed Jan. 30, 1974, Ser. No. 437,905
Int. Cl. H01r *17/18*
U.S. Cl. 339—183 **18 Claims**



1. In a phonoconnector pin plug assembly for coupling with a phono receptacle, said assembly having an electrically conductive pin plug and an electrically conductive socket shell in electrically insulated concentric relation thereabout, the improvement comprising:

said shell having a circumferentially solid but resiliently flexible wall;

said shell having inwardly projecting indentation means in said wall for retaining engagement with the perimeter of a phono receptacle shell coupled therein; and

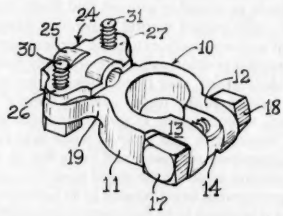
said shell wall having plain arcuate areas extending to a substantial width from opposite sides of the projection means and which areas are resiliently flexibly deflectable radially inwardly into engagement with the receptacle shell by radially outward tensioning of the indentation means when engaged with the receptacle shell.

3,893,744

BATTERY TERMINAL CLAMP

Julius Porazinski, Chicago, Ill., assignor to Triple A Specialty Co., Chicago, Ill.

Filed Jan. 2, 1974, Ser. No. 429,762
Int. Cl.² **H01R** *11/26*
U.S. Cl. 339—230 R **1 Claim**



1. A battery terminal clamp for connecting an electric cable to a battery post, comprising

a. a ringlike body formed from a highly conductive inexpensive soft metal material,

b. a pair of arms provided by said body and extending laterally therefrom in a normal spaced apart relation and providing axially aligned openings therethrough,

c. a thin pliable narrow bridge extending between the free ends of said arms and spaced outwardly from said openings therein and deformable away from said openings upon relative movement of said arms toward each other when said ringlike body is connected onto the battery post,

d. a flat tail portion extending laterally from said ringlike body in a direction opposite to said pair of arms, and

providing a substantially flat top and bottom surface and having a pair of spaced openings formed therethrough to either side of coaxially extending semicircular grooves of different radii formed in said top and bottom surfaces of said tail portion, and

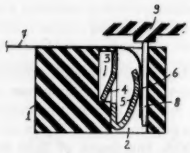
e. a clamping plate connecting the electric cable to said body and provided with threaded apertures adapted to be aligned with said openings formed in said tail portion to threadably receive connecting bolts for attaching said clamping plate onto either side of said tail portion of said body with the electric cable therebetween.

3,893,745

DEVICE FOR THE ELECTRICAL CONNECTION BETWEEN A FLEXIBLE BAND-LIKE CONDUCTOR AND THE END CONTACTS OF AN ELECTRICAL ENERGY UTILIZING APPARATUS

Giuseppe Codrino, Quattordio, Alessandria, Italy

Continuation of Ser. No. 328,625, Feb. 1, 1973, abandoned. This application Oct. 16, 1974, Ser. No. 515,419
Claims priority, application Italy, Mar. 18, 1972, 22075/72
Int. Cl. H01r *13/12*
U.S. Cl. 339—244 R **7 Claims**



1. An electrical connector for connecting a flexible ribbon-like conductor with a rigid terminal of an electrical energy utilizing apparatus, comprising a block of electrically insulating material having an opening and a first and a second abutment means; and a single generally U-shaped spring accommodated in said opening and having one leg resiliently bearing against a surface of said block which defines said opening, and a second leg making electrical contact between said ribbon-like conductor and said terminal when the latter is inserted in a first direction into said opening, one of said legs having a leg portion which engages said first abutment means so as to prevent said spring from axially moving out of said opening in a second direction opposite to said first direction, and a bight portion engaging said second abutment means so as to prevent said spring from axially moving through said opening in said first direction without stressing said spring.

3,893,746

TRACKING MOUNTS FOR CELESTIAL RAY DETECTING DEVICES

Elihu Hassell McMahon, 1870 Schieffelin Ave., Bronx, N.Y. 10466

Continuation-in-part of Ser. No. 177,356, Sept. 2, 1971, Pat. No. 3,751,134. This application May 3, 1973, Ser. No. 357,030The portion of the term of this patent subsequent to Aug. 7, 1990, has been disclaimed.
Int. Cl. G02b *23/16*
U.S. Cl. 350—83 **15 Claims**

1. A tracking mount for a celestial ray detecting device comprising

a. a base;

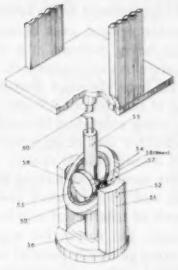
b. support means mounted on the base for rotation about a vertical axis;

c. a plate assembly mounted on the base and operable to assume a position coplanar with the equator of the earth;

d. a tracking arm pivotably mounted on the support means about an axis perpendicular to and intersecting the vertical axis of the support means;

e. means operable to effect such pivoting of the tracking arm as is necessary during rotation of the support means to maintain said tracking arm in a position parallel to the line defined by the intersection of the plane of the plate assembly and the plane within which said tracking arm pivots;

f. means operable to receive and support a ray detecting device, said means being mounted for rotation about a



first axis which is parallel to the axis of rotation of the support means and simultaneously about a second axis which is perpendicular to and intersects said first axis;

g. means operable to rotate said ray detecting device receiving and supporting means about said first axis at the same rate as said support means are rotated; and

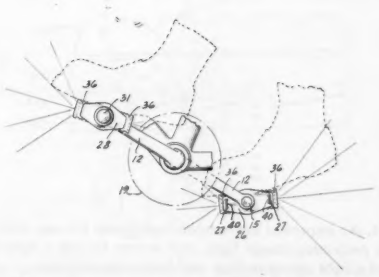
h. means operable to convey the direction and magnitude of any pivoting of said tracking arm to said ray detecting device receiving and supporting means for a corresponding movement of said ray detecting device receiving and supporting means about its second axis.

3,893,747

CONSTANTLY VIEWABLE REFLECTORIZED PEDAL

Robert I. Nagel, Skokie, Ill., assignor to Beatrice Foods Company, Elgin, Ill.

Filed Dec. 28, 1973, Ser. No. 429,097
Int. Cl.[2] G02B *5/12*
U.S. Cl. 350—99 **9 Claims**



1. A reflectorized pedal assembly for a bicycle or the like comprising

A. a pedal shaft means including means for connection at one end thereof to a cycle crank,

B. A hub rotatably mounted on said pedal shaft means,

C. a pair of elongated foot support means in spaced, generally aligned relationship to each other, each one on an opposite side of said hub,

D. mounting means to secure said foot support means in fixed relationship to said hub,

E. a pair of reflector units, each such reflector unit having at least one region comprised of transparent solid material and having a region axis normal thereto, said region having formed therein at least three groups of cube corner reflector elements, all such elements each having a central optical axis, the respective such optical axes of such elements in each such group being disposed substantially parallel to the respective such optical axes of the other such elements in each such group, the respective optical axes of such elements in one such group being generally parallel to said region axis, the respective optical axes of such elements in a second such group being inclined at a predetermined angle relative to said region axis, the respective optical axes of such elements in a third such group being inclined at a different predetermined angle relative to said region axis, said region being retroreflective of light directed thereon over an angle extending up to at least about 45° on either side of said region axis in a plane extending through said region axis,

F. each such reflector unit being adapted for functional association with a longitudinal side of a different one of said foot support means and having both its respective said region axis and its respective said plane generally normal to the axis of rotation of said hub relative to said pedal shaft means, the respective region axes of such reflector units being generally parallel to each other when each such reflector unit is so associated with said foot support means, and

G. mounting means to mount each such reflector unit fixedly in such association with said foot support means.

3,893,748

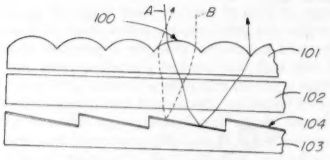
LOW SCINTILLATION, MULTI-COMPONENT PROJECTION SCREEN

James J. De Palma, and Alan P. Van Kerkhove, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 420,755, Nov. 30, 1973. This application Oct. 15, 1974, Ser. No. 514,965

Int. Cl. G03b *21/60*

U.S. Cl. 350—128 **14 Claims**



1. An improved low scintillation screen for use with means for projecting image light, said screen having a light ingress and a light egress surface and further comprising:

a. incident light redirecting means, including a plurality of closely spaced micro-optical elements, for refracting a substantial portion of the projected light rays simultaneously entering each retina-resolvable screen area, respectively along non-parallel paths within the screen; and

b. spacing means for providing a distance for intra-screen light ray travel between said redirecting means and said egress surface, said distance being of magnitude sufficient that the paths of intra-screen travel of such refracted light rays differ by more than the coherence length of the image light projected onto said screen.

3,893,749

PROCESS FOR THE DETERMINATION OF AN ASSEMBLY HAVING ISOTROPIC OBLIQUE REFLECTION IN AN EXTENSIVE SPECTRAL REGION AND ASSEMBLIES OBTAINED BY THIS PROCESS

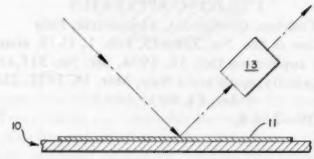
Michael Ferray, Chevilly-Larue, France, assignor to Societe d'Optique, Precision Electronique et Mechanique - Sopelem, Paris, France

Filed Oct. 24, 1973, Ser. No. 409,160

Claims priority, application France, Nov. 20, 1972, 72.41106

Int. Cl. G02b *5/30*

U.S. Cl. 350—147 **7 Claims**



1. Optical assembly for the oblique reflection of a beam of polarized light covering a wide spectrum of wave lengths comprising a plane metallic mirror, a protective layer of transparent dielectric on said mirror having an optical thickness of between 0 and 600A, the beam of light impinging on and being reflected by the mirror and protective layer and crystalline birefringent compensating means receiving the reflected light having birefringent compensation equivalent to that of a crystalline plate having a thickness for which the anisotropy of phases created by said means compensates exactly for the anisotrophy of phases created by said mirror for the means wave length of the spectrum of the beam of light.

3,893,750

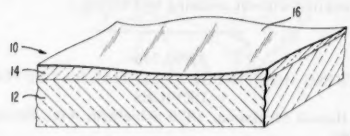
CATHODE-RAY TUBE SCREENING CORRECTION LENS WITH A NON-SOLARIZING MATERIAL

Ralph James D'Amato, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed May 2, 1973, Ser. No. 356,454

Int. Cl. B29d *13/18;* **G02b** *3/04*

U.S. Cl. 350—189 **9 Claims**



1. A refractive device for correcting the paths of light rays in the formation of a color television picture tube screen comprising,

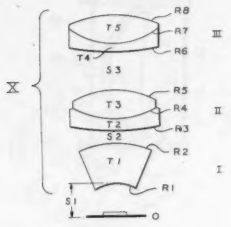
at least a portion of said device having an effective surface thereon for correcting paths of light rays passing therethrough during formation of said screen to substantially correspond to paths electron beams will take in striking the screen in a completed tube, said portion being a silicone resin that is substantially nonsolarizing when exposed to ultraviolet radiation in the range of 290 to 400 nanometers, and

a rigid transparent substrate for supporting said portion.

3,893,751
40X MICROSCOPE OBJECTIVE

Arthur H. Shoemaker, East Aurora, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed Apr. 26, 1974, Ser. No. 464,383
Int. Cl.[2] G02B 9/12, 21/02
U.S. Cl. 350—229 **2 Claims**



1. A microscope objective which is well corrected for chromatic image aberrations, spherical aberration, coma and astigmatism and has three elements aligned along an optical axis, which comprises a concavo-convex positive singlet I as a first element, a double convex positive doublet II as a second element and a double convex positive doublet III as a third element, said elements having the following optical parameters:

Lens	Radius	Thickness	Space	Refractive Index	Abbe Number
			S_1= 0.1591F		
	R_1= −0.5720F				
		T_1=		ND(1)=	
I		0.7659F		1.78833	$\nu(1)$=50.47
	R_2= 0.7315F				
			S_2= 0.0468F		
	R_3= 4.1284F				
		T_2= 0.3282F		ND(2)= 1.80491	$\nu(2)$=25.42
II	R_4= 1.2737F	T_3=		ND(3) =	
		0.6565F		1.69669	$\nu(3)$=56.13
	R_5= −1.6057F				
			S_3= 1.0865F		
	R_6= 11.4873F				
		T_4= 0.3282F		ND(4)= 1.8078	$\nu(4)$=40.74
III	R_7= 1.3057F				
		T_5= 0.6565F		ND(5)= 1.52241	$\nu(5)$=59.50
	R_8= 3.2142F.				

wherein axial thicknesses of successive lens element are T1 to T5, successive axial spaces are S1 to S3, successive lens radii are R1 to R8 where − applies to surfaces whose center of curvature lies on the object side of the vertices, refractive indices and Abbe numbers of the successive lenses are ND(1) to ND(5), $\nu(1)$ to $\nu(5)$ respectively, and F is the focal length of the objective in millimeters.

3,893,752
MICROSCOPE OBJECTIVE

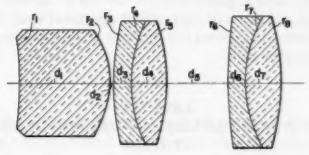
Tsutomu Tojyo, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 17, 1974, Ser. No. 471,060
Claims priority, application Japan, May 18, 1973, 48-56034
Int. Cl. G02b 9/12, 1/00
U.S. Cl. 350—229 **1 Claim**

1. A microscope objective comprising three lens components of five lenses wherein the first lens component is positive meniscus lens with its concave surface positioned on the object side, the second lens component is a positive cemented lens comprising a negative meniscus lens and a biconvex lens and the third lens component is also a positive cemented lens comprising a negative meniscus lens and a biconvex lens, said microscope objective having the following numerical values:

f = 1

r_1 = −4.498	d_1 = 0.949	n_1 = 1.7865	ν_1 = 50.2
r_2 = −0.926	d_2 = 0.023		
r_3 = 2.564	d_3 = 0.186	n_2 = 1.7847	ν_2 = 25.7



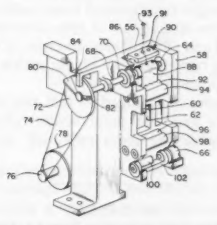
r_4 = 1.349	d_4 = 0.391	n_3 = 1.4866	ν_3 = 84.5
r_5 = −2.151	d_5 = 0.660		
r_6 = 4.399	d_6 = 0.186	n_4 = 1.8061	ν_4 = 40.8
r_7 = 1.318	d_7 = 0.384	n_5 = 1.4978	ν_5 = 66.8
r_8 = −2.587			

where reference symbols r_1 through r_8 represent radii of curvatures of respective surfaces of lenses, reference symbols d_1 through d_7 represent thicknesses of respective lenses and spaces between lenses, reference symbols n_1 through n_5 represent refractive indexes of respective lenses, reference symbols ν_1 through ν_5 represent Abbe's numbers of respective lenses.

3,893,753
OPTICAL ATTENUATOR

Thomas J. Glenn, Irvine, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Feb. 25, 1974, Ser. No. 445,246
Int. Cl. G02f 1/30
U.S. Cl. 350—271 **12 Claims**



1. In an optical attenuator for adjusting the amount of radiant energy passing through a variable aperture therein, the combination comprising:

a frame having a window therein for passage therethrough of a beam of radiant energy;

first and second parallel shafts mounted on said frame on opposite sides of said window for rotation about the axes thereof;

an opaque strip encircling said first and second shafts, the free ends thereof being secured to said first shaft to form a continuous loop, said strip having a width at least equal to the width of said window, said strip having a pair of

apertures adapted to be in alignment with each other and with said window in one angular position of said first shaft;

bias means engaging at least one outer surface of said strip to urge the portion of the strip so engaged into sliding relation with the adjacent surface of said strip, said bias means being positioned intermediate said first and second shafts and being configured for noninterference with said beam;

cam means mounted on said frame and engaging at least one of said first and second shafts for displacing the axis of rotation thereof to thereby adjust the tension on said continuous loop; and

drive means coupled to one of said shafts for providing bidirectional angular rotation thereof to thereby vary the relative positions of said pair of apertures with respect to each other to control the amount of radiant energy passing therethrough.

3,893,754

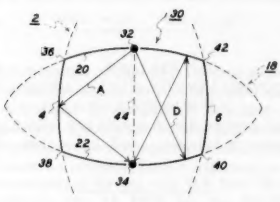
COMBINATION PARABOLOID-ELLIPSOID MIRROR SYSTEM

John A. McInally, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed June 21, 1973, Ser. No. 372,435

Int. Cl. G02b *5/10*

U.S. Cl. 350—294 **3 Claims**



1. A combination ellipsoidal-paraboloidal mirror including:

an ellipsoidal reflector surface disposed about a pair of ellipsoidal focal points defining the principal axis of said mirror,

a first paraboloidal reflector surface having a first paraboloidal focal point,

a second paraboloidal reflector surface facing said first paraboloidal reflector surface and coaxial therewith and having a second paraboloidal focal point,

said first and second paraboloidal focal points each corresponding to one of said pair of ellipsoidal focal points,

the paraboloidal and ellipsoidal geometries of said reflector surfaces being coplanar in all planes which include both of said focal points,

said reflector surfaces arranged so that said ellipsoidal reflector surface and said paraboloidal reflector surface together comprise the inner reflecting surface of said mirror.

3,893,755

MIRROR WITH ADJUSTABLE FOCAL DISTANCE

Claus Christian Cobarg, Steinbach, and Walter Kliegel, Schwalbach, both of Germany, assignors to Braun Aktiengesellschaft, Kronberg; Taunus, Germany

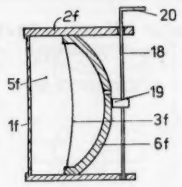
Filed Nov. 12, 1973, Ser. No. 415,005

Claims priority, application Germany, Nov. 15, 1972, 2255789

Int. Cl. G02b *5/10*

U.S. Cl. 350—295 **10 Claims**

1. An adjustable focal length mirror comprising a tubular member, a first transparent wall closing one end of said tubular member, a second deformable wall having a reflecting surface in opposition to said transparent wall and defining a first hollow space in combination with a portion of said tubular member and with said transparent wall, a frame for supporting said deformable wall in spaced opposition to said transparent wall, means for sealing said supporting frame



relative to said tubular member to thereby make said first hollow space airtight and means for displacing said supporting frame and said deformable wall in directions towards and away from said transparent wall.

3,893,756

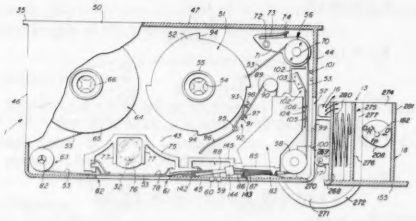
SOUND MOTION PICTURE PROCESSING AND PROJECTION SYSTEM

Donald T. Scholz, Watertown, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed June 28, 1973, Ser. No. 374,639

Int. Cl. G03b *31/02*

U.S. Cl. 352—29 **6 Claims**



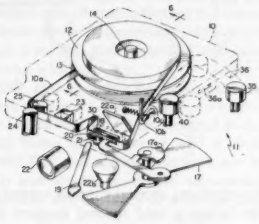
2. Apparatus for sound cinematography, comprising a housing, means forming a receptacle in said housing for receiving a film cassette, incremental drive means engageable with the film in a cassette in said receptacle and operable to advance the film incrementally past a projection station in said housing, second drive means operatively engageable with the film in a cassette and operable to advance the film toward a storage position in the cassette, a film drive capstan, means mounting said capstan in said housing for rotation and for translation between a first position in which said capstan will engage the film in a cassette in said receptacle and a second position in which said capstan will not engage the film in a cassette in said receptacle, sequencing means for sequentially engaging said incremental drive means to engage the film and advance the film incrementally past the projection station and then operating said second drive means to advance the film toward said storage position, and means controlled by said sequencing means for moving said capstan to its first position when said incremental drive means is engaged and to its second position when said second drive means is engaged.

3,893,757

SOUND-AND-PICTURE-ON-FILM REPRODUCING SYSTEM

Kenneth Li Donnici, Brooklyn, N.Y., assignor to Avom Inc., Lynbrook, N.Y.

Filed June 1, 1973, Ser. No. 366,160
Int. Cl.[2] G03B 23/02, 01/22
U.S. Cl. 352—78 R 3 Claims



3. A film magazine for use with a film strip having uniformly spaced perforations near one edge for a sound-and-picture reproducing system including a drive puck having first and second engaging positions, said first engaging position being a direct drive for said drive puck, and said second engaging position being a slip-clutch drive for said drive puck and a disengaging position and a play-back drive puck having engaging and disengaging positions, said magazine comprising, in combination:

a housing;

a central hub disposed within said housing and having first and second coaxial shoulders;

a take-up reel having a rim rotatably mounted on said first shoulder;

a supply reel having a rim rotatably mounted on said second shoulder, said supply reel and said take-up reel being independently rotatable;

a first recess in the bottom of the housing, said first recess being of a size to receive said drive puck throughout at least part of its path to and from its second engaging position to permit said drive puck to engage and be located to slip-clutch drive a rim portion of said take-up reel;

a second recess in the housing for receiving said play-back drive puck throughout at least part of its path to and from its engaging position at which it engages and drives a rim portion of said supply reel;

projecting means for projecting an image on a portion of said film in a predetermined projecting position;

claw means operable for engaging said perforations at predetermined intervals of time and thereby to move successive portions of said film into said projecting position; and

snubbing means cooperating with said claw means for regulating the movement of said film transferred between said reels.

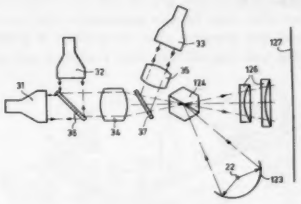
3,893,758

DEVICE FOR PROJECTING PICTURES ON A SCREEN

Jean Jacques Hunzinger, Paris, and Claude Hily, Champigny, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 18, 1974, Ser. No. 461,873
Claims priority, application France, Apr. 20, 1973, 73.14524
Int. Cl. G03b 21/14; G02b 5/30, 27/28
U.S. Cl. 353—20 4 Claims

1. A device for projecting pictures on a screen comprising: a light source, a polarizer/analyzer, a birefringent optical relay, a collimator for collimating the light of the light source on said optical relay, said collimator comprising a first projection objective element, the birefringence of said optical relay being controlled by an electric charge pattern, said first objective element being situated between the polarizer/analyzer and the optical relay, and a second objective element situated



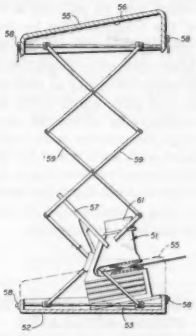
between the polarizer/analyzer and the screen and correcting for optical errors of the first projection objective element, said first objective element determining the power of the projection device.

3,893,759

OFF-AXIS VIEWING APPARATUS

Wynn D. Crew, Lakewood, Colo., assignor to Microtech Press Inc., Lakewood, Colo.

Filed Nov. 14, 1973, Ser. No. 415,704
Int. Cl. G03b 21/24
U.S. Cl. 353—79 12 Claims



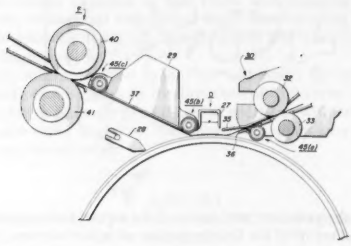
1. Projector-viewer apparatus for display of information stored in microimage size on microfiche and film strip elements comprising a projector, a high gain retroreflector screen having directional refraction characteristics redirecting received light predominantly along lines of refraction substantially coincident with the line of incidence thereof to provide a luminance factor of at least forty at a divergence angle of one and one-half degrees, said projector and reflector screen being cooperatively positioned whereby the center line of projection for said projector is tilted with respect to the plane of said reflector screen, and a conventional plano mirror positioned adjacent said projector in off-axis position with respect to the center line of projection for said projector and away from said predominant lines of refraction of light from said high gain screen whereby images projected to and displayed on said screen are viewed in the mirror without glare.

3,893,760

TRANSFER APPARATUS

Raghulinga R. Thettu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed July 16, 1973, Ser. No. 379,273
Int. Cl. G03g 15/16
U.S. Cl. 355—3 R 1 Claim



1. Apparatus for transferring a charged toner image from he surface of an image bearing plate onto a sheet of final support material including

means defining an image transfer zone for transferring the toner image from the image bearing plate to the sheet of final support material brought in contact therewith within the transfer zone,

means for moving the sheet of final support material into and through the image transfer zone wherein at least a portion of the sheet moves in contact with the image bearing plate, and

dampening means positioned at the support material entrance and exit regions to the transfer zone for preventing shock waves which may be induced in the support material outside of the transfer zone by the moving means from moving into the transfer zone, the dampening means including at least one roller positioned at each of the regions and mounted to rotate so that the velocity of the outer periphery of each roller is at least substantially equal to the velocity at which the support material is advanced through the transfer zone, and vacuum drawing means associated with each roller for placing a uniform tension upon the support material as it moves through the transfer zone, and wherein the roller positioned at the exit to the transfer zone is arranged to contact the non-image bearing side of the support material.

3,893,761

ELECTROPHOTOGRAPHIC TONER TRANSFER AND FUSING APPARATUS

William R. Buchan, Lincoln, Mass., and Robert A. Moore, Amherst, N.H., assignors to Itek Corporation, Lexington, Mass.

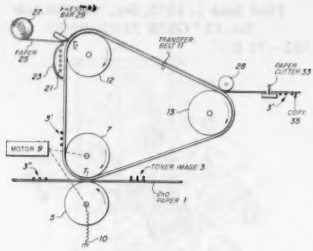
Continuation-in-part of Ser. No. 303,168, Nov. 2, 1972, abandoned. This application Oct. 4, 1973, Ser. No. 403,696
Int. Cl. G03g 15/22
U.S. Cl. 355—3 R 26 Claims

1. An apparatus for transferring a non-fused xerographic toner image from a first support material to a second support material and fusing the toner image to the second support material, comprising, in combination:

a. an intermediate transfer member positioned to receive toner from said first support material, said intermediate transfer member having a smooth surface with a surface free energy of below about 40 dynes per centimeter, a hardness of from about 3 to about 70 durometers, and a heat capacity of below about 3.1×10^{-3} cal/cm²/°C.;

b. means for transferring toner from said first support material to said intermediate transfer member;

c. means for heating toner on said intermediate transfer member to a temperature at which it flows prior to transfer to said second support material;



d. means for supplying second support material; and,

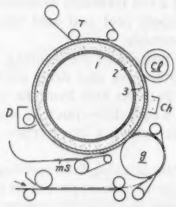
e. means for bringing said second support material into pressure contact with heated toner on said intermediate transfer member in a manner whereby toner is transferred and fused to the second support material.

3,893,762

MASTER PAPER WINDING DRUM IN ELECTROPHOTOGRAPHIC COPYING MACHINE OF CONTACT PRINTING TYPE

Keiichi Inagaki, 4-12 Goshikiyama 7-chome, Taramiku Kobe, Japan

Filed Jan. 23, 1974, Ser. No. 435,989
Int. Cl. G03g 15/00
U.S. Cl. 355—12 3 Claims



1. In an electrophotostatic copying machine of the contact printing type in which images on an original paper are copied on a master paper wound around a master drum, and subsequently transferred to a copy paper, and in which the master drum respectively advances the master paper to a charging means, a light exposure means, a developing means, transfer means, and an image erasing means disposed in series around and adjacent the master drum, the improvement comprising the master drum having a rigid central cylinder, an intermediate resilient coating layer disposed around said central cylinder and a thin metallic outer layer disposed over said resilient layer whereby the outer surface of the master drum is both yieldable and conductive.

3,893,763

LIQUID GATE FOR INDIVIDUAL FILM FRAME PRINTING

Howard F. Ott, Victor, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 31, 1974, Ser. No. 438,494
Int. Cl. G03b 27/68
U.S. Cl. 355—52 7 Claims

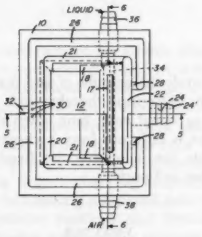
1. In a liquid film gate for use in processing and printing individual film frames, the combination comprising:

a fixed gate member having a first optical window defining a printing aperture, said first window having a first window surface;

said fixed gate member further having first raised lands partially encircling said first window surface and a first slot encircling said first lands and said first window;

a movable gate member in register with said fixed gate member and having a second optical window defining a printing aperture, said second window having a second window surface in register with said first window surface; said movable gate member further having a pair of second raised lands partially encircling said second window surface, and a second slot encircling said second lands and said second window;

said movable gate member being movable relative to said fixed gate member between an open position in which it is spaced from said first gate member to permit insertion of a film frame therebetween, and a closed position in which said first and second windows are in registry, and said first and second lands are substantially in contact with opposite side surfaces of said film frame to support



said film frame with said side surfaces cooperating with said first and second window surfaces to form cavities on each side of said film frame;

means on said fixed and movable gate members operative when said movable gate member is in its closed position for successively directing and guiding a processing liquid into said cavities for filling said cavities, and drying air into said cavities for drying said film frame;

said directing and guiding means comprising a passageway in each of said fixed and movable gate members in which one end of each passageway is connected to a source of liquid and the opposite end of each passageway is connected to a source of drying air;

slits defined by said gate members for connecting each of said passageways to its corresponding cavity;

vacuum means connected to at least one of said first and second slots for drawing said liquid and air into said cavities and across said side surfaces of said film frame in succession for processing and drying said film frame and exhausting said liquid and air; and

bleeder holes defined by said gate members for connecting each of said passageways to said vacuum means.

3,893,764

PLURAL REFLECTOR, SINGLE SPEED UNI-DIRECTIONAL SCANNING DEVICE

Jack Chia Kai Pei, Machida, and Hitoshi Kitahara, Yamato, both of Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

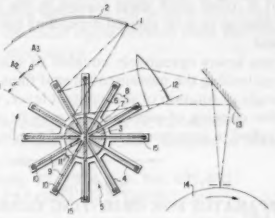
Filed Jan. 17, 1974, Ser. No. 434,182
Claims priority, application Japan, Jan. 29, 1973, 48-11149
Int. Cl. G03b *27/70;* **G03g** *15/04*
U.S. Cl. 355—66 **6 Claims**

6. A manuscript scanning device for copying machines and the like comprising;

a light source for illuminating a stationary document;

a plurality of reflectors for successive scanning of said document;

a plurality of pairs of rotatable reflector support members disposed radially about a predetermined axis, the two members of each pair of reflector support members being radially, co-planarly, respectively disposed on opposite sides of said axis and having internal slots for slideably receiving and supporting one of said reflectors and for providing a continuous path between the two reflector supporting members each pair for said one reflector; and



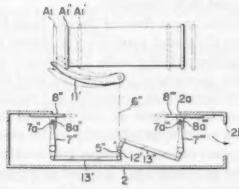
means for continuously rotating said reflector support members about said predetermined axis only in one direction at a constant speed so that each reflector, after scanning a document, retracts along said continuous path from a scanning position on one side of said predetermined axis to a sheltered position on the side of said axis opposite said one side where it does not interfere with scanning by the following reflector and shuttles back and forth between said scanning and sheltered positions as said reflector support members are rotated.

3,893,765

SHEET HANDLING DEVICE FOR PHOTOCOPYING MACHINE

Takashi Yano, Yokohama, and Masumi Ikesue, Tokyo, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed May 9, 1973, Ser. No. 358,649
Claims priority, application Japan, May 11, 1972, 47-45836
Int. Cl. G03b *27/60*
U.S. Cl. 355—73 **3 Claims**



1. A device for positioning and supporting copy sheets for exposure in a photocopying machine comprising

a. a conveyor belt comprising a plurality of belts which are spaced apart from and in parallel with each other on said device and moved in the longitudinal direction of said device,

b. a top plate provided with an aperture whose longitudinal length is smaller than the length of the smallest-sized copy sheet used and whose transverse length or width is substantially equal to that of the largest-sized copy sheet used,

c. a negative pressure chamber formed below said top plate integral therewith and opened at the upper surface of said top plate through said aperture thereof, whereby a copy sheet placed upon said conveyor belt may be attracted and pressed thereupon by the difference pressure between atmospheric pressure and negative pressure pro-

duced in said negative pressure chamber, and air flows flowing in the longitudinal direction of said device may be formed between the copy sheet upon said conveyor belt and said top plate due to the difference between the atmospheric pressure and said negative pressure to prevent production of local, excessive suction forces, thereby maintaining the flatness of the exposure plane regardless of the sizes of copy sheets used,

d. flaps disposed in said aperture of said top plate for controlling the opening of said aperture,

e. a contact lever adapted to engage with a flange of a spool of a rolled copy sheet loaded in the photocopying machine so as to be rotated depending upon the size thereof, and

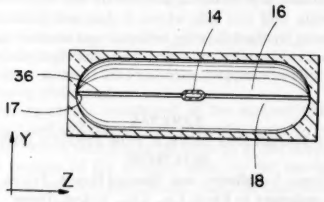
f. cam levers operatively coupled to said contact lever for controlling the movement of said flaps in response to the angle of rotation of said contact lever, whereby the effective opening of said aperture may be automatically controlled in response to the size of a rolled copy sheet used.

3,893,766

APPARATUS FOR ORIENTING GENERALLY FLAT PARTICLES FOR SLIT-SCAN PHOTOMETRY

Walter R. Hogg, Miami Lakes, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed June 14, 1973, Ser. No. 369,910
Int. Cl. G01n *21/26*
U.S. Cl. 356—36 **14 Claims**



2. Apparatus for orienting sample particles suspended in a fluid for observation by slit-scan photometry comprising:

a flow chamber;

means for introducing the fluid suspension into the axial center of said flow chamber;

means for producing a flow of sheath fluid for surrounding said sample fluid and producing a planar laminar flow;

said flow chamber having walls configured in the direction of fluid flow therethrough such that said fluid suspension is caused to accelerate gradually and monotonically; said walls narrowing to form an exit for said fluid suspension located at a point approximately in the center of the fluid flow, and observation means for transmitting a light beam through the flow chamber located at a point prior to said exit adjacent a location where said narrowing of the walls is ended and said acceleration would be substantially terminated.

3,893,767

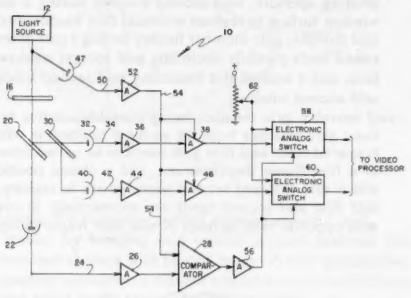
ELECTRO-OPTICAL SYSTEM FOR CANCELLATION OF THE EFFECTS OF RED BLOOD CELLS IN A SAMPLE OF BIOLOGICAL CELLS

Mack J. Fulwyler, Los Alamos, N. Mex.; Garret Francis Ziffer, Natick, Mass.; Gerard Adelard Paquette, Amherst, N.H., and Michael Thomas Gilmore, Watertown, Mass., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Oct. 23, 1973, Ser. No. 408,817
Int. Cl. G01m *1/00*
U.S. Cl. 356—39 **25 Claims**

1. In a method for nondestructively analyzing biological cells located in a sample including cells of at least two types supported in fixed locations relative to each other and which differentially absorb light of known wavelength, the steps of:

illuminating discretely at least parts of each of the cells at their fixed locations in the sample with first light within a first wavelength range;



detecting discretely the amount of said first light from each cell part after absorption thereby; and

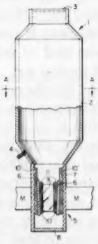
generating a tag signal each time when the thus detected cell part light is different from a chosen value, said tag signal useable for indicating the fixed location in the sample of that cell part.

3,893,768

ZEEMAN MODULATED SPECTRAL SOURCE

Roger Stephens, Hubbards, Canada, assignor to Canadian Patents & Development Limited, Ottawa, Canada

Filed Oct. 23, 1973, Ser. No. 408,273
Int. Cl. G01j *3/30*; H01j *1/50*
U.S. Cl. 356—85 **9 Claims**



1. A spectral source comprising:

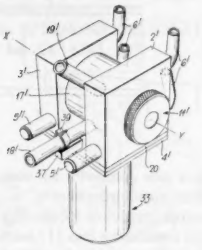
first and second spaced electrodes mounted within said spectral source, said first and second electrodes adapted to be connected across a potential source to produce a plasma causing electric field having substantially parallel straight lines of electric force in a predetermined discharge region between said electrodes and at least one of said electrodes including a material adapted to emit radiation having predetermined spectral lines; and

means adapted to apply a magnetic field to said discharge region with the axis of the magnetic field substantially parallel to said lines of electric force, for producing Zeeman splitting of said spectral lines.

3,893,769
GRAPHITE TUBE FURNACE

John Frederick Woolley, Sawbridgeworth, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed May 30, 1974, Ser. No. 474,398
Claims priority, application United Kingdom, Aug. 21, 1973, 39440/73
Int. Cl.² G01J 3/30; G01N 21/16
U.S. Cl. 356—85 30 Claims

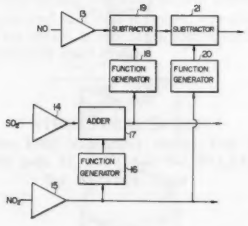


1. A graphite tube furnace for atomic absorption spectroscopy, said furnace comprising: a support; a pair of electrically conductive heat sinks fixed to said support; a hollow ferrule threaded into each of said heat sinks; a hollow tapered bushing mounted inside each respective ferrule; a graphite tube having both ends open and having the said ends thereof mounted inside respective ferrules, each of said bushings being slotted and having spring fingers clamping respective graphite tube ends, each heat sink having a tapered hole cooperating with the taper of respective bushings, said ferrules, bushings and graphite tube forming an assembly defining a hollow, unobstructed path extending completely therethrough through which light can pass in the direction of the axis of the tube.

3,893,770
APPARATUS FOR ANALYSING A PLURALITY OF MIXED GASES

Katsumi Takami, Tokyo; Chiaki Shimbo, Hachioji, and Kyo Suda, Mitaka, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 4, 1973, Ser. No. 394,256
Claims priority, application Japan, Sept. 5, 1972, 47-88826
Int. Cl. G01n 21/34
U.S. Cl. 356—96 2 Claims

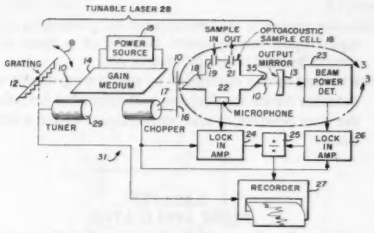


1. An apparatus for analyzing a composite gas comprising:
means for obtaining an absorption spectrum of each of NO_2 gas, SO_2 gas and NO gas, the interferences between each gas being irreversible;
means for converting said each respective absorption spectrum into a first, a second, a third electrical signal in accordance with the intensity of the spectrum thereof;
means for generating a fourth electrical signal for simulating the interference between said NO_2 gas and SO_2 gas, which has the first electrical signal as an input signal;
a first adder which has the fourth electrical signal and the second electrical signal as an input signal;
means for generating a sixth electrical signal for simulating the interference between said SO_2 gas and NO gas, which has a fifth electrical signal derived from said adder as an input signal;
a first subtractor which has the third electrical signal and the sixth signal as an input signal;
means for generating a seventh electrical signal for simulating the interference between said NO_2 gas and said NO gas, which has the first electrical signal as an input;
a second substractor which has the seventh electrical signal and a eighth electrical signal derived from the first subtractor as an input signal.

3,893,771
LASER ABSORPTION SPECTROSCOPY

William E. Bell, Mountain View, Calif., assignor to Diax Corporation, Sunnyvale, Calif.

Filed Aug. 22, 1974, Ser. No. 499,442
Int. Cl.² G01J 3/42; G01N 21/24
U.S. Cl. 356—97 18 Claims



1. In a laser absorption spectrometer:
means for defining an optical resonator;
means for producing a laser beam of coherent radiation within said optical resonator;
means for interposing a sample medium to be analyzed in said laser beam within said optical resonator for absorbing coherent radiation from said beam and for converting said absorbed coherent radiation of the beam into a second form of energy; and
means coupled in energy exchanging relation with the sample medium for detecting said second form of energy resulting from absorption of energy, if any, by said sample medium from said laser beam.

3,893,772
INSTALLATION FOR RESETTING A HEADING INDICATOR

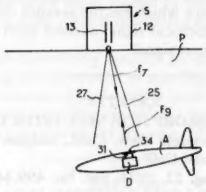
Henri Le Tilly, Paris, and Henri Robin, Rueil-Malmaison, both of France, assignors to Electronique Marcel Dassault, Paris, France

Filed Feb. 21, 1973, Ser. No. 334,448
Claims priority, application France, Feb. 21, 1972, 72.05754
Int. Cl. G01b 11/26
U.S. Cl. 356—141 9 Claims

1. A system for determining the azimuthal deviation between a reference direction and a heading indication given by an instrument aboard a craft moving over a surface area, comprising:
land-based equipment including a source of radiation at the level of said surface area emitting an outgoing laser beam;
sweep means in said equipment for periodically deflecting the outgoing laser beam between predetermined boundaries in a horizontal plane;

a mirror retroreflective in a vertical plane and symmetrically reflective in a horizontal plane aboard said craft for returning said outgoing laser beam toward said source upon passage of said craft through the deflection path thereof with an azimuthal orientation making the returning beam coincident with the outgoing beam;

timing means controlled by said sweep means for marking the start of a deflection cycle of said laser beam;



detector means in said equipment for generating an output signal upon impingement thereon of a laser beam returned by said reflector means; and

calculating means controlled by said timing means and said detector means for deriving said azimuthal deviation from the time position of said output signal within a deflection cycle.

3,893,773

PAINT APPLICATOR

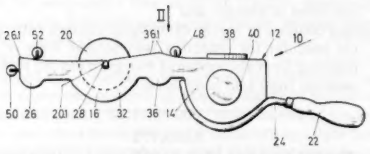
Gerrit Johan Ten Heuw, 28 St. Catherine Rd. Plumstead, Cape Town, South Africa

Filed Mar. 8, 1973, Ser. No. 339,134

Claims priority, application South Africa, Mar. 10, 1972, 72/1672

Int. Cl. A46b *15/00;* **B43m** *11/02, 3/40*

U.S. Cl. 401—15 **6 Claims**



1. A paint applicator comprising a paint container which includes a paint reservoir and an elongated tank having an elongated opening; an axially elongated cylindrical paint applying roller mounted to be partly encased by the elongated tank; supporting means on the tank for supporting the roller; a passage leading from the paint reservoir to the elongated tank for supplying paint under gravity to the elongated tank; a subsidiary reservoir on the side of the tank remote from the paint reservoir and in bidirectional communication with said tank within the confines of said container, into which subsidiary reservoir excessive paint can flow under gravity from the tank; and an additional subsidiary reservoir between said tank and reservoir, said additional subsidiary reservoir extending parallel to said tank.

3,893,774

PIPE CONNECTOR

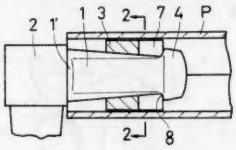
Noriyasu Hashioka, Nishigahara 1-chome, Kita-ku, Tokyo, Japan

Filed Nov. 2, 1973, Ser. No. 412,274

Claims priority, application Japan, Nov. 7, 1972, 47-128311

Int. Cl. E04b *7/08*

U.S. Cl. 403—171 **3 Claims**



1. A two-piece pipe connector for connecting square pipes to form a finished structure wherein

a. a first member comprises a cube-like base piece (2) with at least two connecting legs (1) each leg having an elongated body portion said body portion being connected to said cube-like base at one end and outwardly tapered therefrom to a free end with a disk-like head (4) portion at said free end; and,

b. a second member comprises a locking sleeve (3) having an open end and a rectangular end designed and sized to enter a square pipe open end, four walls extending from said rectangular end having a rounded interior conforming to the shape of said head, at least two end slots along at least two junctions of said four walls and at least two inner slots extending along the centers of at least two walls, so that said second member can be inserted into a square pipe and one head of said first member can be inserted into said second member open end.

3,893,775

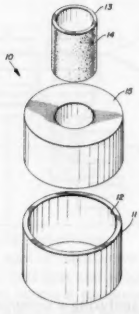
RESILIENT BUSHING WITH LONG FATIGUE LIFE

David L. Sievers; Gary L. Hipsher, both of Logansport, Ind., and Robert Vosburgh, Royal Oak, Mich., assignors to The General Tire & Rubber Company, Akron, Ohio

Filed May 13, 1974, Ser. No. 468,970

Int. Cl. F16b *1/00*

U.S. Cl. 403—225 **13 Claims**



2. A resilient bushing comprising:

an outer rigid member having curvilinear inner surface portions;

an inner rigid member having curvilinear outer surface portions;

at least one of said surface portions being provided as a sandblasted surface with an effective phosphate coating formed on said surface to define an effective roughness

surface height rating selected in accordance with SAE Standard J448a; and

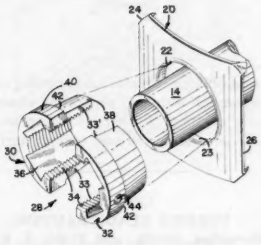
an elastomeric insert compressively positioned between said inner surface portions of the outer member and said outer surface portions of the inner member.

3,893,776

FASTENING APPARATUS FOR PLAYGROUND EQUIPMENT AND METHOD OF ASSEMBLY

John M. Beattie, Bloomington, Minn., assignor to The Toro Company, Minneapolis, Minn.

Filed Jan. 8, 1974, Ser. No. 431,612
Int. Cl.[2] F16L *5/00*
U.S. Cl. 403—259 **13 Claims**



1. A basic unit of construction for use in playground equipment, comprising:

a. a compressible post member having a clearance hole therethrough for receipt of a bar member;

b. a bar member received into the clearance hole in said post member;

c. retaining means engaging one side of said post member and said bar member for preventing said bar member from being withdrawn from said clearance hole from the opposite side of said post member;

d. a first support plate, placed in contact with said post member between said retaining means and said post, having a guide hole substantially axially aligned with said clearance hole, said bar member extending through said clearance hole;

e. first split ring means having an external surface bearing against and adapted to rotate with respect to the periphery of said guide hole, said split ring means threadedly engaging said bar member; and

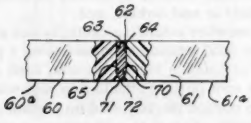
f. means for preventing relative rotation between said first support plate and said post member, whereby rotation of said split ring means in one sense forces said first support plate toward said fixed means.

3,893,777

STRUCTURAL JOINT

Wilson M. Jones, 1703 N. Beckley, Dallas, Tex. 75203

Filed July 31, 1974, Ser. No. 493,231
Int. Cl. F16b *12/04*
U.S. Cl. 403—268 **10 Claims**



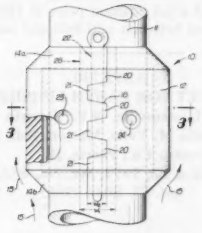
1. A cast joint between at least two plastic body members comprising: means providing a mold space between said members along said joint, said mold space being defined by spaced edge surfaces on said members, an outer portion of said mold space along the length of said space between said members being defined by parallel spaced edge surfaces on said members and an inner bottom portion of said mold space being defined by two surfaces at least one of which is a surface converging with the other of said two surfaces to a line of contact along the length of the bottom of said mold space; and a bonding agent in said mold space between said two body members, said bonding agent being of the same material comprising said two body members and initially being in a liquid form including an inhibitor, said liquid form being mixed with a catalyst and being introduced into said mold space, said liquid bonding agent with said inhibitor and said catalyst being cured within said mold space reacting with said material forming said two members along the boundary of said bonding agent and said edge surfaces of said members defining said mold space whereby said bonding agent and said body members form a homogeneous continuous integral mass.

3,893,778

ANTI-CORROSION PIPE PROTECTOR

Fred D. Williams, Long Beach, Calif., assignor to Hydril Company, Los Angeles, Calif.

Filed June 10, 1974, Ser. No. 477,813
Int. Cl.[2] F16L *58/00*
U.S. Cl. 403—344 **9 Claims**



1. In a well pipe protector,

a. a C-shaped body defining a zig-zag split,

b. terminals on the body to be drawn together in interfitting relation for retention proximate said split after application of the body about the pipe, and

c. a protective flap carried by said body and having freely projecting inwardly and outwardly flexible extent to protectively overlap the side of the pipe inwardly of said terminals and to fully bridge said zig-zag split at the inner side thereof in response to said drawing together of the terminals.

3,893,779

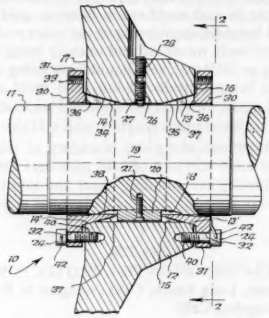
HUB-TO-SHAFT CONNECTION

Joachim W. Schroeter, North Tonawanda, N.Y., assignor to Buffalo Forge Company, Buffalo, N.Y.

Filed May 13, 1974, Ser. No. 469,368
Int. Cl. F16d *1/06*
U.S. Cl. 403—370 **1 Claim**

1. A hub-to-shaft connection comprising a hub, a shaft, a tapered surface on said hub, a collar having a plurality of tapered flexible leaf means circumferentially spaced thereon, and moving means for effecting relative axial movement between said tapered surface on said hub and said tapered leaf means in engagement therewith so as to effect a tight locking engagement between said hub and said shaft; a second tapered surface on said hub spaced from and extending in the opposite direction from said tapered surface, a second collar having a plurality of second tapered flexible leaf means circumferentially spaced thereon, and second wedge-moving means for effecting relative axial movement between said second tapered surface on said hub and said second tapered leaf means

in engagement therewith so as to effect a tight locking engagement between said hub and said shaft at the location of said second leaf means, key means positioned directly between and engaging both said hub and said shaft, said key means being axially spaced on said hub from said leaf means so as to permit



substantially 360° engagement between said leaf means and said hub, screw means for securing said key means to said shaft, and set screw means for securing said hub to said shaft in a predetermined axial position prior to effecting said tight locking engagement between said hub and said shaft.

3,893,780

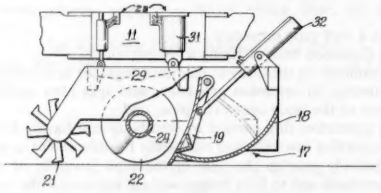
EJECTOR BUCKET FOR EARTH FINISHING MACHINE

Nathan Gutman, Loudonville, N.Y.; Dorwin R. Larsen, Oswego, and Everette M. Volle, Morton, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed June 28, 1974, Ser. No. 483,913

Int. Cl. E01c *19/15*

U.S. Cl. 404—91 **9 Claims**



1. A surface finishing machine including: frame means; a plurality of extending arm means mounted upon said frame means; road traction means for selective movement of said machine mounted upon said extending arm means; and collection means for collecting and selectively dispersing surface building materials, said collection means including a bucket member adjustably mounted upon said frame means, said bucket member having a frontal opening for ingress of surface building material, and ejection means for selectively ejecting said materials from said bucket member through said frontal opening for material ingress.

3,893,781

CENTRIFUGAL PUMP

Yutaka Aga, 603 Higashiune, Akoh, Japan

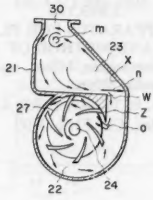
Filed Nov. 27, 1973, Ser. No. 419,388

Int. Cl.² F04D *5/00, 9/02*

U.S. Cl. 415—53 **4 Claims**

1. A centrifugal pump comprising:

a volute chamber having a rotary impeller supported therein, and an air-liquid separating chamber having a substantially right-triangular cross-section and including a bottom planar surface and an oblique planar surface which is inclined with respect to said bottom surface, said bottom surface having an opening therein adjacent one



end of said oblique surface, said opening connecting said volute chamber with said separating chamber, and said separating chamber further including an exhaust port adjacent a second end of said oblique surface.

3,893,782

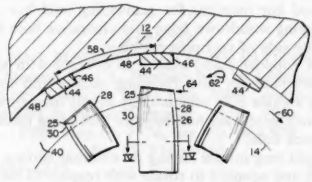
TURBINE BLADE DAMPING

Mario F. Pierpoline, Media, and Frank J. Kuchma, Lansdowne, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 20, 1974, Ser. No. 452,867

Int. Cl. F01d *5/16, 5/10*

U.S. Cl. 415—119 **6 Claims**



1. An axial flow elastic fluid turbine apparatus comprising:

a casing having a central axial bore extending therethrough, said casing having a circumferential groove disposed on the interior surface thereof,

a predetermined plurality of baffle members disposed in said groove, said baffle members being disposed at a predetermined circumferential distance from one another, each of said baffle members traversing said groove and extending radially inward from said groove relative to an axis extending through said bore,

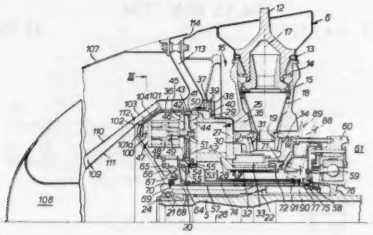
a predetermined number of nozzles directing the flow of elastic fluid in said turbine, and,

a rotating member extending centrally and axially through said bore, said rotating member having a predetermined number of rotating blades thereon, each of said blades having a root portion attached to said rotating member and a tip portion thereon, said tip portion of each of said blades being adjacent to said groove in said casing, said rotating member being operable to direct said elastic fluid from said nozzles into said groove, said elastic fluid directed into said groove being deflected by said baffle members against said rotating blades to reduce vibration in said blades.

3,893,783
GAS TURBINE ENGINES AND BLADED ROTORS THEREFOR

John Gregory Keenan, Cheltenham; John Alfred Chilman, Stroud, and Ivor Harold Brooking, Gloucester, all of England, assignors to Dowty Rotol Limited, Gloucester, England

Filed Feb. 15, 1974, Ser. No. 443,147
Claims priority, application United Kingdom, Feb. 17, 1973, 7883/73; Feb. 17, 1973, 7885/73
Int. Cl. F01d *7/00*
U.S. Cl. 415—129 **9 Claims**

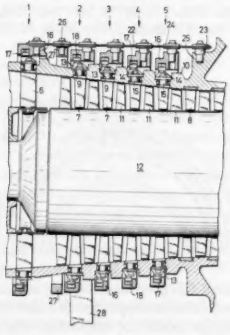


1. A bladed rotor, suitable for a gas turbine engine of the by-pass type, including a hub, which carries, so as to be rotatable therewith, at least one pump operable upon rotation of the rotor, a liquid-pressure-operable actuator for adjusting the blades of the rotor to vary flow of fluid over the blades, control valve means by way of which liquid under pressure is directed from said pump to operate the actuator, and a further pump operable, when said one pump is inoperative or substantially so, by motor means carried by non-rotative structure external of the rotor to supply pressure liquid to the actuator for feathering of the blades.

3,893,784
APPARATUS FOR ADJUSTING STATOR BLADES

Ferdinand Zerlauth, Andelfingen, Switzerland, assignor to Brown Boveri Sulzer-Turbomachinery Ltd., Zurich, Switzerland

Filed Nov. 6, 1973, Ser. No. 413,313
Claims priority, application Switzerland, Nov. 8, 1972, 16246/72
Int. Cl. F04d *29/56, 27/00*
U.S. Cl. 415—149 R **6 Claims**



1. In combination with a multi-stage axial flow turbomachine having a casing and a plurality of stages of adjustable stator blades mounted in said casing about a longitudinal axis; an apparatus for adjusting said stator blades of each stage comprising

a plurality of axially movable adjusting rings rotatably mounted in concentric relation about said axis, each adjusting ring being mounted adjacent a respective stator stage;

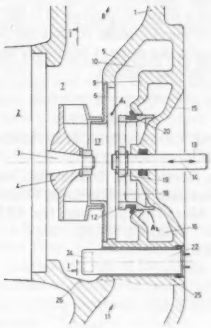
a plurality of levers connecting each adjusting ring to each blade of an adjacent stator stage; and

a plurality of resilient twistable strips secured across and to said rings and pivotally mounted at one end on said casing whereby upon rotation of said one ring, said rings simultaneously rotate and move axially of said axis to turn said blades of successive stages in a linear pattern while said strips are subjected to twisting.

3,893,785
DEVICE FOR MIXING AND IMPELLING OF HEAT-EXCHANGE FLUIDS

Edmund Maron, Steinach, Switzerland, assignor to Aktiengesellschaft Adolph Saurer, Arbon, Switzerland

Filed Aug. 31, 1973, Ser. No. 393,681
Claims priority, application Switzerland, Sept. 5, 1972, 13028/72
Int. Cl. F04d *31/00*
U.S. Cl. 415—157 **6 Claims**



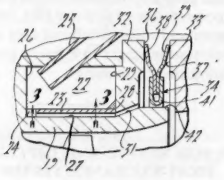
1. In a device for mixing and impelling of heat-exchange fluids, a combination comprising wall means defining a first, a second and a third chamber; an impeller interposed between said first and second chamber and having a suction side adapted to communicate with said first and said third chamber, and a pressure side communicating with said second chamber; and outlet communicating with said second chamber and with a user; a pair of inlets for cooler or hotter heat-exchange fluid each communicating with one of said first and third chambers, respectively; a pair of axially aligned apertures axially spaced from said suction side of said impeller and connecting said first and third chambers with one another; and tubular baffle means shiftable axially in said apertures and operative for increasing the effective cross-section of one of said apertures while simultaneously decreasing the effective cross-section of the other aperture, and vice versa.

3,893,786

AIR COOLED SHROUD FOR A GAS TURBINE ENGINE

Christian J. Rahnke, Roseville, and James K. Vallance, Dearborn Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed June 7, 1973, Ser. No. 368,004
Int. Cl.[2] F01D 25/08
U.S. Cl. 415—178 7 Claims



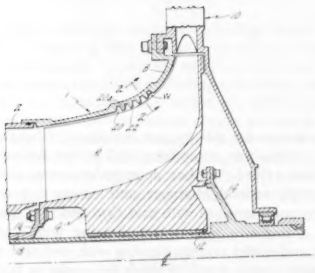
1. In a gas turbine engine having a rotor and a shroud positioned about said rotor,
said rotor being rotatable about a given axis,
said shroud having a generally annular portion encircling said rotor,
a radially inwardly directed first surface of said annular portion having a predetermined clearance from the outer circumference of said rotor,
a second surface of said annular portion being the side opposite said first surface,
means together with said second surface defining a plurality of slots.
said slots forming a portion of passage means connecting a higher pressure area to a lower pressure area whereby air moves through said slots during engine operation,
said slots having a depth in a range of 0.005 to 0.020 inches and being sufficiently small so that the air passing therethrough disturbs the normal boundary layer of heated air against said second surface.

3,893,787

CENTRIFUGAL COMPRESSOR BOUNDARY LAYER CONTROL

Burton A. Jones, North Palm Beach, Fla., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Mar. 14, 1974, Ser. No. 451,257
Int. Cl.[2] F04D 7/02
U.S. Cl. 415—213 R 3 Claims



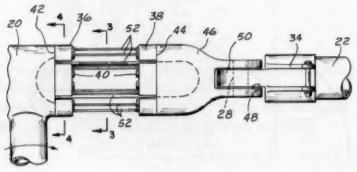
1. A centrifugal compressor being mounted for rotation having an axial inlet for delivering a fluid thereto, and a radial outlet for receiving a compressed fluid therefrom, said compressor having blades thereon each blade having a continuous outer free edge from said inlet to said outlet, said blades having an abrupt flow path section from axial flow to radial flow, a fixed shroud located between said inlet and outlet spaced from the edges of said blades, said shroud having annular grooves located therearound facing said blades, said circumferential grooves being located on the surface of the shroud opposite the abrupt flow path section where the flow-path from said inlet turns abruptly toward a radial direction into said outlet.

3,893,788

FLEXIBLE COUPLING

Richard J. Ditlinger, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Feb. 6, 1973, Ser. No. 330,154
Int. Cl. B64c 27/48
U.S. Cl. 416—134 11 Claims



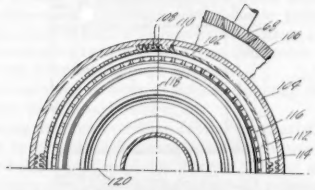
1. A flexible tension-torsion coupling for joining a first member and a relatively movable second member having a longitudinal axis, said coupling comprising:
a plurality of torsionally flexible endless belts each having parallel side portions and opposite end portions connecting the same;
said plurality of endless belts being arranged in circumferentially spaced apart formation around said longitudinal axis;
first retaining means operatively connecting one of said end portions of each of said belts to said first member;
second retaining means operatively connecting the other of said end portions of each of said belts to said movable second member;
said plurality of endless belts being operative to maintain said second member in fixed spaced apart relationship to said first member and torsionally responsive to rotational movement of said second member about said longitudinal axis.

3,893,789

PITCH CHANGE ACTUATOR FOR A VARIABLE PITCH FAN PROPULSOR

Merritt B. Andrews, Westfield, Mass., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Feb. 21, 1973, Ser. No. 334,334
Int. Cl. B63h 3/02; B64c 11/32
U.S. Cl. 416—160 5 Claims



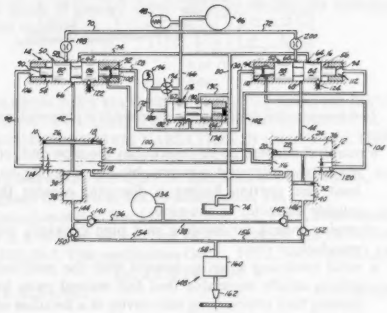
1. For a ducted fan propulsor having a plurality of circumferentially spaced blades supported in a hub driven by a power plant, pitch change means for imparting rotary motion to said blades for varying the blade angle, said pitch change means including a harmonic drive means operatively connected to said blades, and means secured to a nonrotating element spaced from said hub for imparting a pitch change input signal

to actuate said harmonic drive means to position said blades to various blade angles.

3,893,790
DUAL SINGLE ACTION RAM INTENSIFIER

Endre A. Mayer, Birmingham, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Continuation-in-part of Ser. No. 139,098, April 30, 1971, abandoned. This application May 29, 1973, Ser. No. 364,595
Int. Cl.[2] F04B *17/00;* **F16D** *31/02*
U.S. Cl. 417—346 **1 Claim**



1. A fluid actuated intensifier comprising:

first ram intensifier means including a piston member disposed in a cylinder means to form an upper chamber defined by said cylinder means and one head of said piston and a lower chamber defined by the other head of said piston and said cylinder means;

second ram intensifier means including a piston member disposed in a cylinder means to form an upper chamber defined by said cylinder means and one head of said piston and a lower chamber defined by the other head of said piston and said cylinder means;

means for introducing fluid into said lower chambers;

means for pressurizing said upper chambers including a constant pressure source capable of supplying said fluid to said upper chambers without a substantial drop in pressure due to substantial flow into said upper chambers resulting from compression of said fluid in said lower chambers;

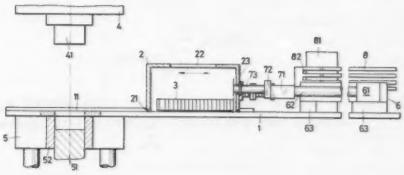
said means for pressurizing said upper chambers also including control means cyclically pressurizing said upper chambers by communication with said constant pressure source so as to cause said piston members to alternately move to pressurize said fluid introduced into said lower chambers and including means causing each of said pistons to move to a return position after said pressurization cycle, said control means further including means causing simultaneous pressurization of both of said upper chambers and means causing both piston members to simultaneously move to pressurize said lower chambers preceding the return movement of either of said piston members by said simultaneous pressurization, said control means including a pair of control valve means operatively associated with each of said ram intensifiers operable independently of each other to produce said simultaneous pressurization of said ram intensifier means, and further including start-up valve means causing said control valves to momentarily pressurize one of said upper chambers and depressurize the other of said upper chambers during start-up of said intensifier, whereby said piston members initially assume oppositive positions in said cylinder means;

common outlet means receiving fluid pressurized in said lower chambers, including means providing communications of said lower chamber with said common outlet means during said pressurization and discontinuing communication during said return movement.

3,893,791
PRESSING APPARATUS

Werner Plocher, Horb-Ihlingen; Franz Kuhl, Herdecke; Karl Mertl, and Bernhard Huttermann, both of Glinde, all of Germany, assignors to Jurid Werke GmbH, Glinde and Maschinenfabrik Lauffer & Butscher, Muhlen, both of, Germany

Filed June 3, 1974, Ser. No. 476,147
Claims priority, application Germany, June 6, 1973, 2328699
Int. Cl. B30b *11/02, 15/30*
U.S. Cl. 425—78 **5 Claims**



1. A pressing apparatus for compacting powdered material into compacted bodies comprising

a table having a table surface,

a die chamber within said table and having a filling opening bordered by parts of said table surface, compacting means cooperating with said die chamber for compacting the contents thereof,

a frame having wall means which are provided with lower and upper edges and which enclose an interior space, said upper edges defining a top opening for receiving powdered material, and said lower edges which are in substantially close and complete contact with said table surface, defining a bottom opening for the discharge of said powdered material,

grating means in said interior space free of contact with said wall means,

driving means for reciprocatingly moving said frame on the table surface from a first receiving position to a second discharge position on top of the filling opening and back, and for oscillatory motion of said grating means,

rigid coupling means between said grating means and said driving means,

and lost motion coupling means between said frame and said driving means.

3,893,792
CONTROLLER FOR INJECTION MOLDING MACHINE

Frank Laczko, Duxbury, Mass., assignor to BBF Group, Inc., Westwood, Mass.

Filed Apr. 6, 1973, Ser. No. 348,614
Int. Cl. L29f *1/06*
U.S. Cl. 425—149 **24 Claims**

1. For an injection molding machine having a mold defining a cavity for receiving a plasticized material to form an article during a cycle of operation of the machine, a controller comprising;

variable pressure applying means for forcing the material into the cavity,

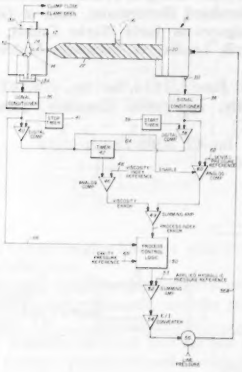
means associated with the variable pressure applying means for sensing applied pressure,

transducer means in or proximate said cavity for sensing cavity pressure,

means responsive to the applied and cavity pressures for establishing a time reference viscosity signal,

means for establishing a viscosity error signal during an initial portion of the cycle when the time reference viscosity signal deviates from a predetermined reference signal,

and means responsive to said viscosity error signal for operating the pressure applying means at a new pressure level during the remainder of the cycle.



3,893,793

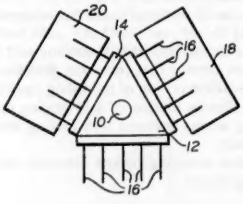
MOLDING APPARATUS WITH TEMPERATURE COMPENSATING CORE RODS

John J. Farrell, Green Brook, N.J., assignor to Farrell Patent Company, Dunellen, N.J.

Filed Mar. 23, 1973, Ser. No. 344,128

Int. Cl. B29d *23/03*

U.S. Cl. 425—242 B **9 Claims**



1. Molding apparatus including a head having a side face, a mold adjacent to said face and having spaced apart openings opposing said face, core rods carried by the head and projecting therefrom for extending into said openings in the mold, holders carried by the head for supporting the core rods, and bearings in the holders and on the core rods, said bearings and holders having surfaces confronting one another and extending substantially normal to the longitudinal axes of the core rods for holding the core rods that extend from said face in parallel relation to one another, the bearing and holder surfaces having relative movement with respect to one another and the care rods having relative movement with respect to the head and normal to said axes for changing the spacings of the core rods from one another to compensate for differences between the temperature of the head and the temperature of the mold and the resulting changes in the spacings of the openings in the mold into which the core rods must extend.

3,893,794

APPARATUS FOR FORMING A SOCKET IN THERMOPLASTIC PIPE

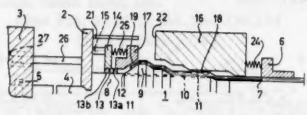
Petrus Marinus Acda, Enkhuizen, Netherlands, assignor to Polva Nederland B.V., Enkhuizen, Netherlands

Filed Oct. 9, 1973, Ser. No. 404,335

Claims priority, application Netherlands, Oct. 13, 1972, 7213924

Int. Cl. B29c *17/00*

U.S. Cl. 425—393 **7 Claims**



1. An apparatus for forming a socket in a pipe end, comprising:

a mandrel adapted to be inserted in the pipe end, comprising a base part and a removable shaping ring having at least one portion having a diameter greater than the outside diameter of the pipe;

clamping means for holding said pipe coaxially with said mandrel;

a mold enclosing a cavity coaxial with the mandrel, comprising axially separable first and second parts having a parting face intersecting said cavity at a location of greatest diameter of said cavity, said first mold part at an end away from said parting face and adjacent said clamping means having a first interior cylindrical surface having a diameter substantially equal to the outside diameter of the pipe, said second mold part at an end away from said parting face having a second interior cylindrical surface having a diameter at least equal to said outside diameter;

a thrust member having a tubular portion whose wall thickness is at least equal to that of the pipe, said tubular portion slidably mounted on said base part of said mandrel for relative axial motion and having an outside surface slidable within said second interior surface of the second mold part;

means for producing relative axial displacement between said clamping member and said mandrel, mold and thrust member; and

means for displacing said thrust member axially with respect to said mandrel and mold.

3,893,795

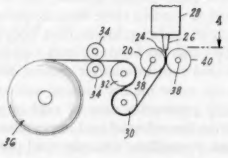
EMBOSSING ROLLS WITH AREAS OF DIFFERENTIAL HARDNESS

Jan P. Nauta, West Hartford, Conn., assignor to Rowland Development Corporation, Kensington, Conn.

Division of Ser. Nos. 65,433, Aug. 20, 1970, Pat. No. 3,751,550, and Ser. No. 360,370, May 14, 1973, Pat. No. 3,839,514. This application Aug. 5, 1974, Ser. No. 494,703

Int. Cl. B29c *15/00*

U.S. Cl. 425—403 **6 Claims**



1. An embossing roll having a surface coating of elastomeric synthetic resin, and a circumferential inner portion having

valleys and ridges therein, said elastomeric resin of said surface coating being relatively resilient and of lesser hardness than the material of said circumferential inner portions, said surface coating covering said circumferential inner portion including the ridges thereof and having a multiplicity of embossing formations extending over substantially the entire surface thereof, said surface coating being of greater depth in the valleys of said inner portion than at the ridges of said inner portion to provide varying depths of sald elastomeric resin underlying said embossing formations, the surface resilience of said surface coating being greater at said valleys than at said ridges, said resin of said surface coating being relatively resilient so as to permit resilient distortion of said coating at least in said areas of greater depth upon application of sufficient pressure thereto.

3,893,796

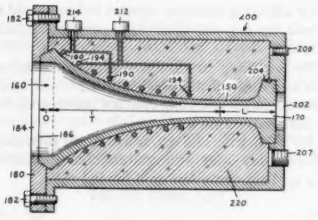
EXTRUSION DIES HAVING DIFFERENT SHAPED INPUT AND OUTPUT ORIFICES AND AN INTERMEDIATE REGION OF UNIFORM VARIATION IN CROSS-SECTION PER UNIT OF DISTANCE

Edward Korostoff, and Gary K. Zin, both of Philadelphia, Pa., assignors to Matcon, Inc., Philadelphia, Pa.

Continuation of Ser. No. 118,595, Feb. 25, 1971, abandoned, which is a division of Ser. No. 18,499, March 11, 1970, Pat. No. 3,588,987. This application Oct. 1, 1973, Ser. No. 402,297

Int. Cl. B29f *3/04*

U.S. Cl. 425—461 **7 Claims**



1. A liner for use in an extrusion die for extruding material into a desired profile, the liner comprising a wall having an input orifice, an output orifice, an internal contour connecting the input orifice to thte output orifice, a transition region of said internal contour having at a first end, a shape substantially identical to the shape of the input orifice and at a second end, a shape substantially identical to the shape of the output orifice, said region having a gradual transition in cross-sectional area from the first end to the second end and the output orifice having a pattern, the pattern land portion of said internal contour having third and fourth ends, said third end corresponding to the second end of the transition portion and the fourth end corresponding to the output orifice of the liner.

3,893,797

PHOTOFLASH LAMP AND METHOD OF COATING SAME

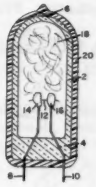
Harold L. Hough, Beverly; Emery G. Audesse, Salem, and Thomas J. Sentementes, Wakefield, all of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed July 3, 1972, Ser. No. 268,576

Int. Cl.² F21K *5/02*

U.S. Cl. 431—94 **12 Claims**

1. A photoflash lamp comprising an hermetically sealed glass envelope, a combustion-supporting gas in said envelope, a quantity of combustible material located in said envelope, ignition means attached to said envelope and disposed in operative relationship to said combustible material, and a thermoplastic coating of substantially uniform thickness vac-



uum formed onto the entire exterior surface of said glass envelope and exerting a compressive load thereon.

3,893,798

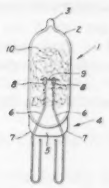
PHOTOFLASH LAMP

Vaughn C. Sterling, Cleveland, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 15, 1972, Ser. No. 315,663

Int. Cl. F21k *5/02*

U.S. Cl. 431—95 **1 Claim**



1. In a miniature flashlamp comprising a hermetically sealed light-transmitting envelope having an internal volume of approximately 0.4cc or less, a quantity of filamentary combustible material distributed within said envelope, a filling of combustion-supporting gas in said envelope, and an electrical-ignition system secured at one end and in communication with the interior of said envelope, the improvement wherein said electrical-ignition system includes 0.5–2.5 milligrams of an adhesively bonded solid primer mixture which comprises in percentages by weight of 1–5% sodium chlorate, 1–4% polyvinyl pyrrolidone, 1–6% sodium perchlorate, and the balance being zirconium with said primer mixture having been applied as an aqueous suspension of zirconium having the sodium chlorate, sodium perchlorate and polyvinyl pyrrolidone dissolved therein.

3,893,799

ABRASIVE WHEELS FOR CIGARETTE LIGHTERS AND METHOD OF MAKING SAME

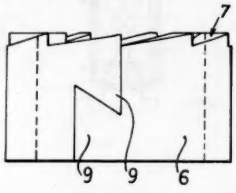
Robert Hocq, Boulogne-sur-Seine, France, assignor to Societe Franco-Hispano-Americaine (FRANCISPAM), Saint-Gratien, France

Filed Apr. 24, 1973, Ser. No. 353,990

Claims priority, application France, Apr. 26, 1972, 72.14817

Int. Cl. F23q *1/02*

U.S. Cl. 431—274 3 Claims



1. Abrasive wheel for a cirgarette lighter which comprises a metallic strip provided with integral lateral ratchet teeth on one side thereof and having ends which interfit to hold it in a cylindrical shape, the outer cylindrical surface of said strip being knurled.

3,893,800

BACKSIDE HEATING AND FIXING APPARATUS IN AN ELECTRONIC PHOTOGRAPH DUPLICATOR

Shoji Wako, Atsugi, Japan, assignor to Rank Xerox, Ltd., London, England

Filed Nov. 14, 1973, Ser. No. 415,598

Int. Cl. G03g *15/00;* B65h *17/28*

U.S. Cl. 432—60 5 Claims

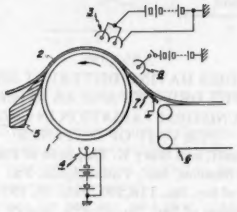
1. A method of fusing toner images to a substrate utilizing a heated member and guide means for directing the substrate into contact with the heated member and further utilizing first means for effecting intimate contact between said substrate and said heated member and second means for effecting intimate contact between the substrate and said guide means, said method comprising the steps of:

moving said substrate into contact with said guide means and said heated roll, in that order;

energizing said first means for affecting intimate contact between said substrate and said heated roll; and

subsequently energizing said second means for effecting intimate contact between said substrate and said guide means for preventing trail-end flip-up of said substrate.

2. Apparatus for fusing powder images to a substrate, said apparatus comprising:



a heated roll for contacting the side of said substrate opposite said powder images;

means for guiding said substrate into contact with said heated roll;

means for effecting intimate contact between said substrate and said heated roll once said substrate contacts said heated roll;

means for providing an attractive force between said guide means and said substrate subsequent to the energization of said means for effecting contact between said substrate and said heated roll; and

means for rendering said attractive force providing means operative only after intimate contact is established between said substrate and said heated roll.

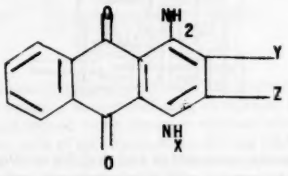
3,893,801

TRANSFER DYEING

Cyril Eric Vellins, Cheadle; Leonard Fox Dixon, Elland, and Bryan Ronald Hinchliffe, Huddersfield, all of England, assignors to L. B. Holliday & Co. Limited, Huddersfield, England

Filed June 14, 1973, Ser. No. 369,970
Int. Cl. D06p *1/20*
U.S. Cl. 8—2.5 **12 Claims**

1. A method of transfer printing comprising printing with an ink a desired design onto a transfer backing material, and thereafter transferring the printed design by the application of heat from the backing material to a synthetic fabric which is to be dyed or printed, the ink comprising a base medium and at least one dyestuff having the formula



in which: X is an unsubstituted alkyl group having from 1 to 6 carbon atoms, Y and Z are cyano or hydrogen, at least one of Y and Z being cyano.

3,893,802

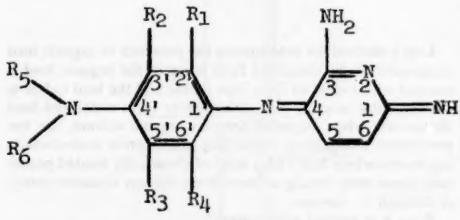
INDAMINES AND METHOD OF USING THE SAME

Gregoire Kalopissis, Paris; Andree Bugaut, Boulogne-sur-Seine, and Francoise Estradier, Paris, all of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Continuation-in-part of Ser. No. 131,458, April 5, 1971, abandoned. This application Aug. 13, 1973, Ser. No. 387,612
Claims priority, application Luxembourg, Apr. 10, 1970, 60702
Int. Cl. D06p *3/04*
U.S. Cl. 8—10 **15 Claims**

1. A dye composition for coloring keratinic fibers comprising a solution of an indamine in a solvent selected from the group consisting of water and wanter and a lower alkanol, said indamine being present in amounts effective to dye said keratinic fibers and being selected from the group consisting of

a. an indamine having the formula



wherein R_1, R_2, R_3 and R_4 each independently are selected from the group consisting of hydrogen, halogen, lower alkyl having 1–4 carbon atoms and lower alkoxy having 1–4 carbon atoms, and R_5 and R_6 independently are selected from the group consisting of hydrogen, lower alkyl having 1–4 carbon atoms and lower alkyl having 1–4 carbon atoms and substituted with a member selected from the group consisting of hydroxy, acylamino, carbamyl and piperidino,

b. an acid salt of said indamine in (*a*), and

c. a double chloride of zinc and said indamine in (*a*).

3,893,803

HAIR DYEING PREMIXES CONTAINING PEROXIDASE ENZYMES STABILIZED WITH HEME COMPLEXING AGENTS

Emil Thomas Kaiser, Chicago, Ill., assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 10, 1972, Ser. No. 296,465
Int. Cl. A61k *1/12*
U.S. Cl. 8—10.2 **6 Claims**

1. A premix solution for dyeing hair comprising:

A. from about 0.005 ppm to about 500 ppm of a peroxidase enzyme;

B. from about 0.01 to about 1% of a nitrogenous ligand which is a heme complexing agent selected from the group consisting of imidazole, benzimidazole, pyridine, ammonia, benzotriazole, 1,2,3-triazole, 1,2,4-triazole, pyrazole, 2-isoimidazole and pyrrole;

C. from about 0.1 to about 1% of an anti-oxidant selected from the group consisting of sodium sulfite, sodium dithionite, thioglycolate and ascorbic acid;

D. from about 0.01 to about 6% of an oxidation dye precursor selected from the group consisting of a primary oxidation dye precursor, a secondary dye precursor and mixtures thereof; and

E. balance, water, said composition having a pH of from about 4 to about 10.

3,893,804

CONTINUOUS PROCESS FOR THE SIMULTANEOUS HIGH GRADE FINISHING AND DYEING OF CELLULOSIC PIECE GOODS

Josef Hepp, Frankfurt am Main, and Joachim Walter Lehmann, Kelkheim/Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 22, 1973, Ser. No. 334,834
Claims priority, application Germany, Feb. 25, 1972, 2208991
Int. Cl. D06p *1/30*
U.S. Cl. 8—17 **3 Claims**

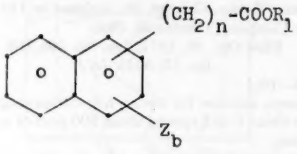
1. A continuous process for the simultaneous highgrade finishing and dyeing of piece-goods of cellulose fibres and mixtures thereof with linear polyester fibres, with leuco esters of vat dyestuffs wherein: the textile material is impregnated at room temperature with an aqueous bath which contains (1) a leuco ester of a vat dyestuff; (2) an aminoplastprecondensate which may be heat hardenable and/or a reactant resin selected from the group of cyclic urea derivatives consisting of methylol-ethylene urea, methylol-hydroxy-ethylene urea, dimethylol dihydroxy-ethylene urea, dimethylol-ethylene urea, dimethylol-propylene urea, dimethylol triazinone, dimethylol-glyoxal monoureine, tetramethylol-acetylene diurea, dimethyl-dihydroxyimidazolone and dimethylol-hexahydropyrimidinone which crosslink with the cellulose fibre; and (3) a condensation catalyst acting as acid donator selected from the group consisting of chlorides, nitrates, and sulfates of zinc, magnesium and ammonium, hydrochlorides of aliphatic and aromatic amines, alkali salts of aliphatic monocarboxylic acids containing a halogen atom, and halogenacetamides; and the material thus treated is then dried and then subjected to dry heat at 150° to 230°C.

3,893,805
PROCESS FOR DYEING SYNTHETIC FIBERS EMPLOYING NAPHTHYL DYE ASSISTANTS

Kurt A. Dellian, Ossining, N.Y., and Samuel Lee, Fairlawn, N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 26, 1973, Ser. No. 326,921
Int. Cl. D06p *1/68*
U.S. Cl. 8—173 **4 Claims**

2. A process for dyeing polyester fibers or fabric in a dyebath which comprises a mixture of a disperse dyestuff and a carrier of the formula



wherein R_1 is C_1–C_4 alkyl, benzyl or phenyl; Z is halogen or C_1–C_4-alkyl; *n* is 0 or 1 and *b* is 0, 1 or 2.

3. The process of claim **2** wherein the carrier is added to the dyebath in the form of an emulsion which comprises the carrier, from 3–20% by weight of carrier of an emulsifier and water.

3,893,806
METHOD FOR CONTINUOUS WARP DYEING POLYESTER AND BLENDS OF POLYESTER ON CONVENTIONAL PAD-STEAM DYE SLASHER

Wilton C. Finch, and David C. Eller, both of Burlington, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Jan. 19, 1973, Ser. No. 325,035
Int. Cl. D06p *1/68*
U.S. Cl. 8—174 **13 Claims**

1. A process for the continuous dyeing of polyester yarns, said process comprising first forming a disperse dye solution by admixing water, 0.5 to 5 oz. of at least one disperse dye per gallon of solution, and 5 to 35 oz. per gallon of solution of at least one at most somewhat water miscible, unemulsified, halogenated aromatic compound containing at least 6 carbon atoms which is a solvent for said disperse dye and which is soluble in water at room temperature before emulsification at most to the extent of about 10% by weight, and thereafter adding 0.2 to 1 oz. per gallon of solution of an anionic wetting agent per gallon of water, adding at least 1 oz. per gallon of solution of a thickener, thereafter applying said disperse dye solution to polyester yarns on a steam-pad dye slasher in an amount of at least 50 percent by weight of the yarn, and fixing the disperse dye upon said yarn by steaming the yarn to a temperature of at least 220°F. until the dye is fixed on the yarn.

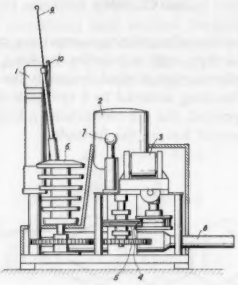
3,893,807
DEVICE FOR HEATING OF INSTRUMENTS PARTICULARLY FOR STERILIZATION

Bedrich Čížinský, Prague, Czechoslovakia, assignor to Universita Karlova, Prague, Czechoslovakia

Filed Nov. 30, 1973, Ser. No. 420,386
Int. Cl. A61l *3/00*; **C12k** *1/10*
U.S. Cl. 21—82 R **5 Claims**

1. An apparatus for the flame sterilization of the work-end for instruments which comprises:

a base, a shaft mounted to said base; a burner means providing a flame, said burner means being mounted on said base adjacent and parallel to said shaft; a container rotatably mounted on said shaft, said container holding instruments having a work-end and a handle end, the instruments to be sterilized being placed with instrument handle-end on the bottom and to one side of the container and the working-end of each instrument extending beyond and supported by the upper edge of the opposite side of the container so as to hold said instrument work-ends within the flame of said burner means; a means

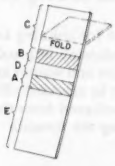


operatively connected to said shaft for rotating said container for moving said instruments into and out of said flame, and an automatic means operatively connected to said burner means for maintaining a flame on said burner means only when said instruments are within said flame.

3,893,808
METHOD AND PAPER TEST STRIP FOR DETERMINING LOW LEVELS OF LEAD IN HYDROCARBON FUELS

Ralph L. Campbell, Brecksville, Ohio, assignor to Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 372,863, June 22, 1973, abandoned. This application Sept. 20, 1974, Ser. No. 504,606
Int. Cl. G01n *31/22*, *33/22*
U.S. Cl. 23—253 TP **17 Claims**



1. In a method for determining the presence of organic lead compounds in hydrocarbon fuels wherein the organic lead is reacted with iodine to form lead iodide and the lead iodide is subsequently reacted with dithizone to form a colored lead dithizonate when extracted into an organic solvent, the improvement comprising: contacting said organic lead-containing hydrocarbon fuel with a strip of chemically treated paper, said paper strip having at least three distinct separate zones, A through C, wherein

Zone A is treated with iodine;

Zone B is treated with a mixture of iodine and potassium iodide; and

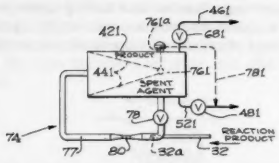
Zone C is an untreated area adjacent to Zone B;

whereon contacting said hydrocarbon fuel with the paper test strip, the organic lead compounds in the fuel by means of capillary action are reacted in sequence at Zone A and then at Zone B to form lead iodide, and the lead iodide thusly formed is converted to characteristically colored lead dithizonate in Zone C of the paper strip by applying to Zone C a solution of dithizone in an organic solvent.

3,893,809
SULFONATION PROCESS AND APPARATUS

William L. Rifenberick, 1645 Cielito Dr., Glendale, Calif. 91207

Division of Ser. No. 803,551, March 3, 1969, abandoned. This application Jan. 10, 1974, Ser. No. 432,212
Int. Cl.[2] B01F 3/08; C07L 143/24
U.S. Cl. 23—260 4 Claims

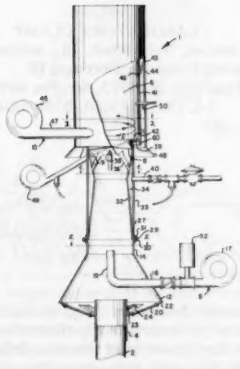


1. Apparatus for sulfonation comprising means for circulating a fluid reaction stream including circulation loop means and first and second pump means in opposed relation in the loop means, each of said pump means having inlet and outlet means, said first pump means having a larger capacity than said second pump means to provide a greater output head, separate means for feeding sulfonatable compound and sulfonating agent into the inlet of said first pump means to mix with said circulating reaction stream in said first pump means, and means to discharge the thus formed reaction mixture into the outlet of said second pump means, the greater output head of said first pump means forcing the reaction mixture through the second pump means at a desired circulating rate against the opposing pumping action therein to provide shearing turbulence in the reaction mixture within the second pump means, means downstream of said pump means for cooling the reaction stream in said loop means and means for withdrawing from said loop means a portion of said circulating reaction stream containing sulfonated product.

3,893,810
FLARE STACK BURNER FOR ODOR AND POLLUTANT ELIMINATION

La Clede Lientz, P.O. Box 430, Branson, Mo. 65616

Filed Dec. 18, 1972, Ser. No. 316,260
Int. Cl. F23g 7/06; F23c 9/04; B01j 9/16
U.S. Cl. 23—277 C 9 Claims



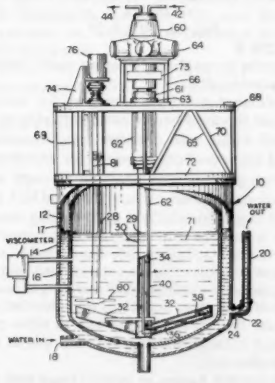
1. A flare stack burner comprising:

a. a conduit operable for conducting an effluent waste gas from its source in a stream;
b. a primary air supply means communicating with said conduit to supply air to the effluent waste gas;
c. means associated with the primary air supply means for adjusting the flow rate of air therefrom;
d. a housing means having portions defining an annular fuel supply manifold extending around the stream of air and effluent waste gas, said fuel supply housing means having a plurality of circumferentially spaced jet members directed generally downstream for discharge of flowable combustible fuel in streams into the mixture of effluent waste gas and air downstream of the primary air supply means;
e. an elongate tubular housing forming a combustion chamber having an interior larger than the interior of the fuel supply housing means and having one end portion mounted on the fuel supply housing means downstream therefrom, said tubular housing having a second end remote from said fuel supply housing means forming an exhaust opening;
f. means adjacent the fuel jet members discharge for igniting the mixture of fuel, air and effluent waste gases;
g. a mixing chamber means between the fuel supply housing means and the combustion chamber, said mixing chamber means including a plurality of circumferentially spaced baffles each positioned downstream of a respective jet member for deflecting the mixture of air and effluent waste gas generally transversely through the streams of fuel for mixing therewith, said baffles sloping upwardly and away from said respective jet members for inducing the mixture of air, fuel and effluent waste gas to flow in a vortical path into the combustion chamber; and
h. temperature sensing means located in the combustion chamber to determine the temperature of the gases therein, and means responsive to said temperature sensing means for controlling the rate of flow of fuel into the combustion chamber from the fuel supply housing means.

3,893,811
APPARATUS FOR PRODUCING POLYAMIDE ESTERS

Adrian J. Good, and Thaddeus P. Kurek, both of Fort Wayne, Ind., assignors to Valspar Corporation, Ft. Wayne, Ind.

Continuation of Ser. No. 122,056, March 8, 1971, abandoned. This application Apr. 18, 1973, Ser. No. 352,273
Int. Cl. C08f 1/98
U.S. Cl. 23—285 4 Claims



1. Apparatus for producing a polyamide resin from an aromatic dianhydride and an aromatic diamine compising a reaction vessel for receiving an essentially anhydrous organic solvent having functional groups which are non-reactive with

the polymer-forming reactants and a solvent for at least said aromatic dianhydride, means for supplying under anhydrous conditions and carefully controlled temperatures an aromatic dianhydride with said solvent to form a high viscosity slurry by combining an amount of such dianhydride in said solvent which is in excess of the dianhydride solubility limits within said solvent; means for charging to said vessel a quantity of aromatic diamine in close succession to the formation of said slurry before said slurry precipitates into an insoluble mass and thereby converting the aromatic dianhydride and aromatic diamine to a precursor having a greater solubility in said solvent sand and of molar proportions consisting of two parts of one of said reactants to one part of the other of said reactants whereby a reaction mass is formed within said vessel, means for cooling said reaction mass within said vessel as determined by the viscosity of said reaction mass so produced to closely control the reactions occurring in said solvent; means for controlling the viscosity of the reaction mass by controlling the temperature of such mass and including means forming a part of said vessel for regulating the order and concentration of dianhydride and diamine additions to said vessel; means for withdrawing a portion of the reaction mass within said vessel and returning said portion after testing the viscosity thereof, a high speed first agitating means disposed within said vessel for stirring at a relatively high speed the low viscosity mixture of aromatic dianhydride and solvent, a lower speed second agitating means also within said vessel for stirring the mixture of aromatic dianhydride, aromatic diamine and solvent as said initial mixture is converted to a precursor of substantially greater viscosity; means for heating the aromatic dianhydride prior to its introduction into said reaction vessel whereby said dianhydride is rendered substantially water free; means for rendering the organic solvent substantially anhydrous by passing such solvent through a molecular sieve connected between said supply and vessel whereby said molecular sieve renders the solvent substantially anhydrous and means for withdrawing the product from within said vessel at the termination of reaction conditions.

3,893,812

REGENERATION APPARATUS WITH EXTERNAL REGENERATED-CATALYST RECYCLE MEANS

Algie J. Conner, Downers Grove; Daniel Dudych, Des Plaines, and Willas L. Vermilion, Arlington Heights, all of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 258,135, May 30, 1972, Pat. No. 3,843,330. This application Dec. 28, 1973, Ser. No. 429,421

Int. Cl. B01j *9/20*

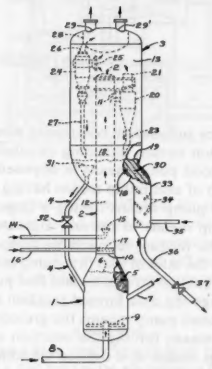
U.S. Cl. 23—288 B **5 Claims**

1. An apparatus for oxidizing coke on spent catalyst which comprises in combination:

a. a spent-catalyst receiving chamber for containing a dense-phase fluidized bed of catalyst having an interface maintained within said chamber, said chamber having upper and lower sections, a means for introducing fresh-regeneration-gas into said chamber through said lower section to form said dense-phase fluidized bed, said fresh-regeneration-gas introduction means being connected at the lower section of said spent catalyst receiving chamber, a spent-catalyst inlet means connected to said chamber to allow passage of spent catalyst into said chamber, and a regenerated-catalyst/regeneration-gas outlet means at the top of said upper section of said chamber above the dense phase fluidized bed interface to allow passage of regenerated catalyst and regeneration gas in admixture from said chamber;

b. a transfer conduit having an upper closed end, an inlet at its lower end connected to said regenerated catalyst/regeneration-gas outlet means, said transfer conduit extending vertically upward from said spent catalyst receiving chamber and extending vertically upward through the lower portion of a hereinafter described regenerated-catalyst receiving chamber into said chamber, and having an outlet adjacent its upper end located within said chamber, said outlet connected to the inlet of a first cyclone separation means whereby regenerated catalyst and regeneration gas are carried in admixture from said spent-catalyst receiving chamber to said separation means and separated thereby;

c. a regenerated-catalyst receiving chamber for containing separation means and a dense-phase bed of catalyst, said chamber being positioned entirely above said spent-catalyst receiving chamber and having upper and lower sections, a spent-regeneration-gas outlet means connected to said chamber at its upper section to allow pas-



sage of spent regeneration gas from said chamber, and a regenerated catalyst stripper connected to said chamber at its lower section, said stripper having connected to its outlet a regenerated-catalyst outlet means to allow passage of regenerated catalyst from said stripper; and,

d. an external regenerated-catalyst recycle means connected to said regenerated-catalyst receiving chamber and to said spent-catalyst receiving chamber to allow passage of regenerated catalyst from the regenerated-catalyst receiving chamber to the spent-catalyst receiving chamber;

said spent-catalyst receiving chamber, said transfer conduit, and said regenerated-catalyst receiving chamber being positioned substantially on a common vertical centerline.

3,893,813

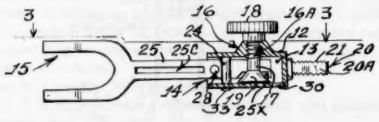
LABORATORY CLAMP

Arthur F. Johnson, Northbrook, Ill., assignor to Humboldt Manufacturing Company, Norridge, Ill.

Filed Oct. 26, 1973, Ser. No. 409,929

Int. Cl. B01l *9/00;* **B25b** *5/04*

U.S. Cl. 23—292 **8 Claims**



1. An adjustable laboratory clamp having structural configurations suited to fabrication by die-casting processes and comprising a cavitateous head structure defined by integrally conformed bottom wall and surrounding side wall portions providing an open face opposite said bottom wall portion, said side wall portions providing a passage therethrough; a pair of tong legs entering said passage and each having an inner end

portion disposed in the cavity of the head structure; post members integrally conformed with said bottom wall and having respective free ends terminating substantially at the plane of said open face, said inner end portions of the tong legs each being pivotally captured on one of said post members; spring means acting on said legs to diverge the same; helically-displaced rotary wedge means in said cavity cooperative with said inner ends of the tong legs to converge the same when rotatively displaced in one direction and permitting spring-urged divergence of the legs when rotatively displaced in the opposite direction; closure means for said open face comprising a plate having support on said head structure and at the free ends of said post members; and means at said free ends of the post members securing said plate in position as aforesaid.

3,893,814

INSTALLATION OF INCENDIARY LINERS IN BOMBS THROUGH USE OF PRELINED TUBULAR STEEL STOCK

Barry L. McGhee, Virginia Beach, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 16, 1972, Ser. No. 281,065
Int. Cl. B21k *21/06*
U.S. Cl. 29—1.21 **5 Claims**

1. A method of producing an incendiary casing for an ordnance device comprising the steps of:

inserting a tube of pyrophoric material into a tubular member to form a liner thereof, said pyrophoric material being susceptible of either hot or cold forming;

forming said tubular member and said tube of pyrophoric material into a desired final configuration; and

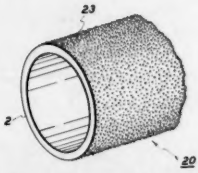
heat-treating the final configuration to produce the desired physical characteristics.

3,893,815

MAGNETIC BRUSH SUPPORT MEMBER

Arthur Drummond, Jr., Walworth, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 8, 1973, Ser. No. 414,015
Int. Cl. B21b *31/08*
U.S. Cl. 29—132 **8 Claims**



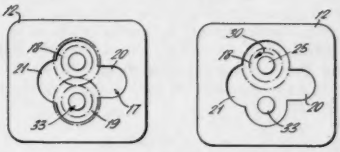
1. A magnetic brush support member comprising a hollow sleeve having an endless surface for supporting a magnetic brush including magnetic particles the improvement wherein: said sleeve is formed of a composite comprising, a metal binder component and a particulate second phase component, said second phase component comprising a material which has a greater abrasion resistance than said metal binder component, a portion of said particulate second phase component protruding from said binder component at said support surface of said member.

3,893,816

GEAR PUMPS

Allan John Payne, Asthal Leigh, near Leafield, England, assignor to Smiths Industries Limited, London, England

Filed Nov. 21, 1972, Ser. No. 308,613
Claims priority, application United Kingdom, Nov. 24, 1971, 54678/71; Jan. 3, 1972, 72/72; Sept. 8, 1972, 41702/72
Int. Cl. B23p *13/00*
U.S. Cl. 29—156.4 WL **9 Claims**



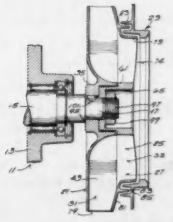
1. A method of manufacturing a gear pump of the kind comprising a housing including a body having surfaces defining a recess, a pair of metal gears disposed in the recess in meshing engagement, each gear having a multiplicity of teeth spaced apart around its periphery, individual shafts for the gears, means mounting the gears on respective ones of the shafts for rotation therewith, and bearing apertures in which the shafts are rotatably mounted, said recess including an inlet region centrally and to one side of an imaginary line joining the rotational axes of the gears and an outlet region centrally and to the opposite side of the imaginary line whereby hydraulic fluid is impelled by the gears from the inlet region to the outlet region; said method comprising the steps of partially forming the said recess in which the meshing gears are to be disposed, mounting a said gear on a said shaft for rotation therewith, rotatably mounting the said shaft in one of said bearing apertures with said gear being positioned outside of said recess in overlapping relation to a portion of said body which bounds said recess, rotatably driving the said gear and the said shaft about their rotational axis, and effecting relative movement between the gear and the said body by moving said shaft longitudinally within its bearing aperture to draw said gear toward and into said recess while the gear is being rotatably driven thereby to cause the gear teeth to cut into said body portion to increase the transverse dimensions of the said recess.

3,893,817

DIE CASTABLE CENTRIFUGAL FAN

Eugene R. Hackbarth, Kenosha, Wis., and Harry M. Ward, III, Waukegan, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Division of Ser. No. 320,073, Jan. 2, 1973, Pat. No. 3,782,851. This application Oct. 3, 1973, Ser. No. 403,177
Int. Cl. B21k *3/00*
U.S. Cl. 29—156.8 CF **5 Claims**



1. A method of manufacturing a fan assembly including a flange extending radially outwardly in relation to the intended rotational axis, and a plurality of angularly spaced vanes each extending from the flange in generally radially outwardly

projecting relation to the intended rotational axis and having an outer part extending arcuately in a plane extending parallel to the intended rotational axis and perpendicularly to a plane extending radially from and containing the intended rotational axis, said method comprising the steps of die casting a first fan member with the flange and with a plurality of angularly spaced vane portions projecting from one surface of the flange, die casting a second fan member with a second plurality of vane portions corresponding in number and angular spacing to the vane portions of the first fan member, each of the second member vane portions including the vane outer parts, aligning the first and second fan members to locate the vane portions in alignment, and assembling the first and second fan members with the vane portions in alignment and so as thereafter to maintain the vane portions in alignment.

3,893,818

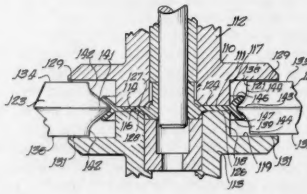
METHOD OF MAKING ROTARY MEMBER

Frank Mickus, Chicago, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 17, 1973, Ser. No. 425,453

Int. Cl. B21d *53/26*; **B21k** *1/28, 1/42*

U.S. Cl. 29—159 R **5 Claims**



1. A method of making a circular grooved member comprising the steps of:

providing a metal blank having a disc-like web;

confining an inner portion of said web between corresponding annular faces of a pair of dies with an outer annular portion of said web projecting outwardly beyond the annular faces of said dies;

rotating said dies and blank together at a speed providing a selected linear velocity of the outer perimeter of said web;

rotating said blank in contact with at least one rotating forming roller;

permitting said blank to rotate relative to the annular faces of said dies while feeding said roller toward the axis of rotation of said blank for subjecting the mid part of the web projecting portion to radial and axial plastic flow forming a root and a pair of diverging walls, and simultaneously spin forming the resulting walls to define a pair of oppositely facing cup-like portions extending from said web; and

forming the walls of said cup-like portions to define a groove of desired shape.

3,893,819

METHOD OF MAKING TIEPIN LATCHING MEMBER

Daniel O. Schaiewitz, 3111 S. Semoran Blvd., Orlando, Fla. 32807

Filed June 17, 1974, Ser. No. 480,056

Int. Cl. B21f *43/00*; **B23p** *13/60*

U.S. Cl. 29—160.6 **6 Claims**

1. The method of making a decorative latching member comprising the steps of:

a. making a decorative member having an opening in one end thereof;

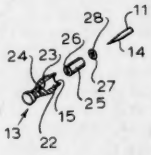
b. placing a plastic insert having an aperture therein into the opening of said decorative member;

c. placing an insert guide having angled surfaces and a center opening therethrough into said opening in said decorative member over said plastic insert; and

d. rolling the edges of said opening in said decorative member onto said insert guide to hold said insert guide and plastic insert in said decorative member whereby a pin of predetermined size may be guided into said aperture in said plastic insert by said insert guide and frictionally held by said plastic insert.

3. A method of making a decorative jewelry latching member comprising the steps of:

a. making a sleeve having one end partially closed with means for removably attaching a holding arm;



b. removably attaching a holding arm through said sleeve to said partially closed end;

c. molding a settable decorative material onto said sleeve;

d. removing said removable attached holding arm from said sleeve;

e. inserting a plastic insert having an opening therein into said sleeve; and

f. sealing said plastic insert having an opening therein into said sleeve whereby inserting a pin of predetermined size into said opening in said plastic insert will frictionally engage and removably hold said pin thereto.

3,893,820

CU-[AG]-CDO ELECTRIC CONTACT MATERIALS

Terrence Ardern Davies; Peter Douglas, and David John Pedder, all of Northampton, England, assignors to Square D Company, Park Ridge, Ill.

Filed Oct. 25, 1972, Ser. No. 300,629

Claims priority, application United Kingdom, Oct. 27, 1971, 49876/71

Int. Cl. C22c *1/05*

U.S. Cl. 29—182.5 **22 Claims**

1. A sintered composite material which consists essentially of copper and between approximately 2.5 percent and 20.0 percent by weight cadmium oxide.

3,893,821

SILVER ELECTRICAL CONTACT MATERIALS CONTAINING $La_{1-x}Sr_xCrO_3$

Terrence Ardern Davies, St. James, N.Y., and Peter John Swallow, Blisworth, England, assignors to Square D Company, Park Ridge, Ill.

Filed July 16, 1973, Ser. No. 379,512

Claims priority, application United Kingdom, July 18, 1972, 33656/72

Int. Cl. B22f *1/00, 3/00*

U.S. Cl. 29—182.5 **10 Claims**

1. An electrical contact material which consists of a mixture of silver and 1.0 to 20 weight per cent of lanthanum, strontium chromite of formula $La_{1-x}Sr_xCrO_3$, where the values of x lie between 0 and 1.0, formed as a hard, chemically inert, nonmetallic phase of high electrical conductivity both within the bulk of, and at the surface of, the contact material.

3,893,822

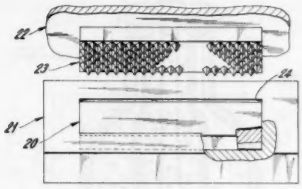
MASTER PATTERN FOR PRODUCING CAST RAISED FIGURES

Thomas M. Camilleri, 277 Avenue West, Brooklyn, N.Y. 11223

Division of Ser. No. 186,690, Oct. 5, 1971, Pat. No. 3,747,440. This application June 11, 1973, Ser. No. 368,642. The portion of the term of this patent subsequent to July 24, 1990, has been disclaimed.

Int. Cl. B22f 5/00

U.S. Cl. 29—183 1 Claim



1. The product of a method of producing a mirror image imprint of figures in a metal nonsheet material to serve as a master for the casting of raised figures such as lettering found on plaques and plates which method comprises:

a. forming a plurality of voids in said nonsheet material without removing material in the surface which is to receive said imprint, said voids being suitable to accommodate the flow of material to be displaced during the imprinting of said figures and being located both within and without the areas to be occupied by said imprinted figures;

b. Arranging and securing forms of the figures to be cast in fixed relationship corresponding to the raised figures to be produced by castings; and

c. Impressing said forms into said material thereby causing that material in the areas occupied by said forms to be displaced and causing a flow of material into a plurality of said voids to occur to produce in undistorted imprint constituting an exact mirror image replica of the figures to be cast, said plurality of voids which receive said material including voids located outside the areas occupied by said figures.

3,893,823

CLADDING SYSTEM

Thomas E. Webb, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Division of Ser. No. 316,177, Dec. 18, 1972, Pat. No. 3,850,585, which is a continuation of Ser. No. 78,276, Oct. 5, 1970, abandoned. This application May 31, 1974, Ser. No. 474,883The portion of the term of this patent subsequent to Nov. 26, 1991, has been disclaimed.

Int. Cl. B32b 15/20; A47j 27/00

U.S. Cl. 29—195 13 Claims

1. In the art of making porcelain enameling sheet having a cladding layer of aluminous metal selected from the group consisting of type 1XXX aluminum of at least 99.0% purity and aluminum base alloys of the 3XXX series containing up to about 1.5% manganese by weight, the improvement which comprises bonding said cladding to a core of aluminum base alloy consisting essentially of aluminum, 2.2 to 3.0% copper, 0.3 to 0.6% magnesium and 0.10 to 0.40% manganese by weight.

3,893,824

FERROMAGNETIC THIN FILMS BY ELECTROPLATING

Eiichi Tadokoro; Masashi Aonuma, and Tatsuji Kitamoto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara, Japan

Filed Oct. 3, 1973, Ser. No. 403,295

Claims priority, application Japan, Oct. 3, 1972, 47-99226

Int. Cl. B23p 3/00; G11c 11/02

U.S. Cl. 29—194 6 Claims

1. A magnetic recording medium comprising a support having thereon an electroplated ferromagnetic thin layer consisting essentially of from 90 to 99.98 wt.% of cobalt-nickel alloy based on 100 wt.% of said thin layer consisting of from 30 to 90 wt.% of cobalt and from 10 to 70 wt.% of nickel, and said ferromagnetic thin layer additionally containing from 0.01 to 5 wt.% of copper and from 0.01 to 5 wt.% of zinc.

3,893,825

INHIBITION OF CORROSION

Leonhard A. Goeller, Des Plaines, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 103,001, Dec. 30, 1970, abandoned. This application Jan. 8, 1973, Ser. No. 321,888

Int. Cl. C10l 1/22

U.S. Cl. 44—66 2 Claims

1. Jet fuel which is corrosive to metal on contact with water containing, as an inhibitor against corrosion, a corrosion inhibiting concentration of a secondary amine comprising a salt of hydrogenated N,N-ditallowamine and hydroxystearic acid.

3,893,826

COATED ABRASIVE MATERIAL COMPRISING ALUMINA-ZIRCONIA ABRASIVE COMPOSITIONS

James R. Quinan, Loudonville, N.Y., and Joseph E. Patchett, Niagara Falls, Canada, assignors to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 196,838, Nov. 8, 1971, abandoned, which is a continuation of Ser. No. 814,162, April 7, 1969, abandoned. This application Aug. 13, 1973, Ser. No. 388,013

Int. Cl.[2] B24D 11/00; C09K 3/14

U.S. Cl. 51—295 1 Claim

1. A coated abrasive article comprising or plate flexible backing having co-fused alumina-zirconia abrasive grits adhesively bonded thereto, said alumina-zirconia abrasive having been solidified from the molten state at least as rapidly as is accomplished by casting molten alumina-zirconia abrasive into a mold filled with ¾ inch lumps of abrasive grains, said grits having an average maximum to minimum dimensional ratio of at least 1.2 to 1, the zirconia in the eutectic being in the form of rods or platelets with the average diameter orplate thickness being less than 3000 angstroms as measured at the colony centers, said alumina-zirconia grits containing from 20 to 50% zirconia, and including eutectic alumina-zirconia colonies having an average size of less than 65 microns, the adhesive bond being sufficiently strong to hold the alumina-zirconia grits to permit fracture thereof during grinding with creation of new cutting edges on the individual grits as the result of the fracture.

3,893,827

SELECTIVE REMOVAL OF CONSTITUENTS FROM FLUIDS

Colin James Leppard, Emsworth, England, assignor to CJB Development Limited, London, England

Filed Aug. 15, 1973, Ser. No. 388,352

Int. Cl. B01d 53/14, 53/02

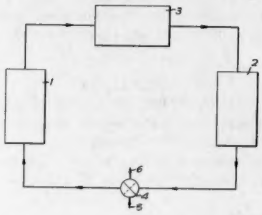
U.S. Cl. 55—25 3 Claims

1. A process for removing a first constituent from a gas containing at least a first, second and third constituent wherein said second constituent interferes with the removal of said first constituent, which process comprises the steps of:

(i). subjecting the gas containing said first and second constituents to a first treatment with a first bed of a reversible absorbent for said second constituent to remove said second constituent therefrom;

ii. removing said first constituent from the gas treated in step (i);

iii. subjecting the product gas of step (ii) to a second treatment with a second bed of a reversible absorbent for said second constituent which absorbent has previously absorbed said second constituent, the second constituent being desorbed from said second bed of reversible absorbent and being reintroduced into the gas to produce a product gas containing said second constituent in the absence of said first constituent;



iv. operating steps (i), (ii) and (iii) in a cyclical manner by reversing the direction of flow of the gas before said absorbent becomes saturated and before the desorbing material becomes denuded of the second constituent; energy being supplied to the system to accommodate incidental energy losses during operation solely by operating the first treatment in step (i) at a pressure which is higher than that of the second treatment in step (iii).

3,893,828

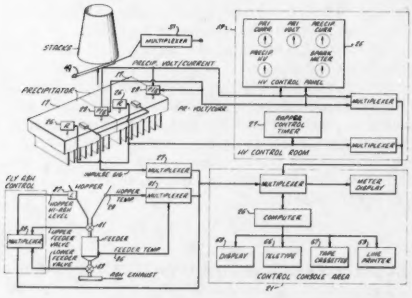
ELECTROSTATIC PRECIPITATOR CENTRAL MONITOR AND CONTROL SYSTEM

William E. Archer, San Pedro, Calif., assignor to Wahlco, Inc, Costa Mesa, Calif.

Continuation of Ser. No. 379,637, June 11, 1973, abandoned. This application June 28, 1974, Ser. No. 484,360

Int. Cl. B03c *3/68*

U.S. Cl. 55—104 **10 Claims**



1. An emission monitor and control system for an industrial electrostatic precipitator used to remove particulate contaminants from process waste gases prior to discharging such waste gases into the atmosphere comprising: condition responsive means operatively connected to said precipitator for sensing power supply, and rapper and dust disposal operating conditions and exhaust gas contact conditions; and computer monitoring and display means in operative communication with said condition responsive means for monitoring said conditions.

3,893,829

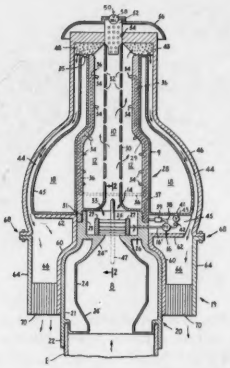
GAS PURIFICATION APPARATUS

Joseph V. Valentino, 1120 Jensen Ave., Mamaroneck, N.Y. 10543

Filed July 13, 1972, Ser. No. 271,484

Int. Cl. B01d *47/06*

U.S. Cl. 55—225 **25 Claims**



1. An apparatus for the purification of gases comprising a gas column having a gas receiving inlet and a normally closed substantially cylindrical portion of substantially uniform diameter in fluid communication therewith, said portion having a plurality of openings therein, a closed scrubbing chamber annularly disposed around said portion and in fluid communication therewith through said openings to permit the passage of gas from said to said chamber, turbine means mounted for rotation in said column and adapted to be rotated by gas moving through said column, liquid pumping means operatively connected to said turbine means to be driven thereby, a liquid reservoir, said liquid reservoir being annularly disposed about said chamber, means for introducing liquid into said chamber in a direction substantially opposite to the direction of the flow of gas as the gas enters said chamber, said liquid pumping means being operatively connected between said reservoir and said liquid introducing means and effective when driven to pump liquid from said reservoir through said introducing means into said scrubbing chamber and a gas discharge outlet in communication with said chamber.

3,893,830

CO-CURRENT ABSORBER FOR RECOVERING INORGANIC COMPOUNDS FROM PLANT EFFLUENTS

Alfred W. Petersen, and John M. Stewart, both of Salt Lake City, Utah, assignors to Stauffer Chemical Company, Westport, Conn.

Filed June 7, 1973, Ser. No. 367,923

Int. Cl. B01d *47/06*

U.S. Cl. 55—236 **11 Claims**

1. A co-current absorber useful in recovering inorganic compounds from plant effluents comprising:

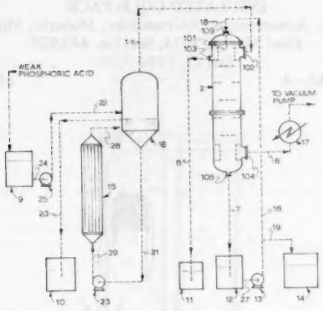
a substantially vertical housing having an upper portion and a lower portion;

said upper portion of said housing having a first entry port for circulating liquid; a second entry port in said upper portion of said housing for entry of vapors; and said upper portion having a cyclone entrainment separator concen-

trically positioned within said housing forming an annular space therebetween and cooperating with respect to said second entry port; means for closing said annular space at the bottom of said upper portion; a first exit port in said upper portion of said housing for removing de-entrained liquids from said cyclone entrainment separator;

a plurality of baffles rigidly and spacially mounted within said housing between said upper portion and said lower portion to form a tortured path for the liquid and vapors resulting in renewed droplet surfaces;

a vapor exit port in the side of said lower portion of said housing and a liquid exit port in the bottom of said housing;



a centrifugal entrainment separator having a tubular member communicating with the housing between the upper and lower portion containing said baffles consisting of a tubular wall with an opening therein remote to said vapor exit port, said tubular member being concentrically positioned within said lower portion and having a connecting wall member forming an annular space between the housing and the tubular wall and communicating with said vapor exit port in the side of said lower portion of said housing and means for closing the annular space at the top of said lower portion.

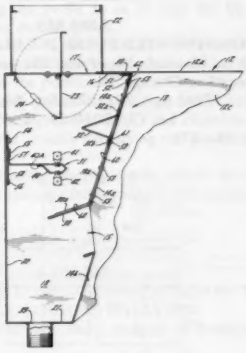
3,893,831

GREASE EXTRACTOR FOR KITCHEN VENTILATING SYSTEMS

DeWitt H. Doane, Long Grove, Ill., assignor to Doane Manufacturing Company, Wheeling, Ill.

Filed Oct. 10, 1972, Ser. No. 296,128
Int. Cl. B01d *45/18*
U.S. Cl. 55—242 **10 Claims**

1. A grease extractor for removing grease, oil, and other contaminants from a vaporous exhaust stream in a kitchen ventiliating system, said extractor comprising the combination of a housing having top and bottom walls, front and rear walls, and a pair of side walls, said front wall forming a restricted, horizontally elongated entranceway for receiving the vaporous exhaust stream; an entrance baffle extending rearwardly from the top of the entranceway for deflecting the entering exhaust stream rearwardly over the bottom wall and against said rear wall for deflecting the exhaust stream upwardly past the rear edge of said entrance baffle; a substantially horizontal rear baffle extending forwardly from said rear wall above said entrance baffle toward the front wall of the extractor, said rear baffle extending forwardly beyond the rear edge of said entrance baffle and being formed of a single sheet of metal which is turned back at the forward end of the baffle to form a fluid manifold extending across the length of the baffle and to strengthen said rear baffle, and the turned back portion of the single sheet of metal has a longitudinal edge which is joined to the main body portion of said sheet by a fluid-tight continuous well extending across the full length of the baffle; a plurality of nozzles in fluid communication with said manifold and spaced along both the top and bottom of said manifold for discharging a selected fluid into the extractor both above and below said rear baffle; top baffle means extending rearwardly from said front wall above said rear baffle means for deflecting



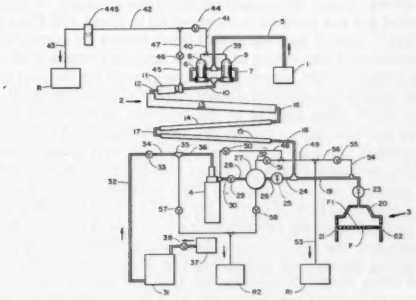
the exhaust stream rearwardly from said front wall; an exit opening formed by the top wall of said housing for discharging the exhaust stream from the extractor; and drain means in said bottom wall for receiving the extracted contaminants deposited on said baffle means and the walls of said housing and conducting the same out of the housing.

3,893,832

STERILE FLUID SYSTEM

John H. Perry, Doraville, Ga., and Jean Roger Nasica, Paris, France, assignors to The Mead Corporation, Dayton, Ohio

Filed Nov. 1, 1973, Ser. No. 411,980
Int. Cl. B01d *46/00*
U.S. Cl. 55—268 **7 Claims**



1. A sterile fluid system comprising source means of gas under pressure, gas conditioning means interconnected with said source means for sterilizing said gas, at least one point of use means of conditioned gas, conduit means interconnecting said gas conditioning means and said point of use means to supply gas under pressure to said point of use means, a source means of pressurized sterilizing fluid interconnected through normally closed valve means with said conduit means, normally closed separate vent valve means interconnected with said gas conditioning means, said conduit means and said point of use means and arranged when open to vent said gas conditioning means, said conduit means, and said point of use

means to atmosphere, and means for simultaneously opening said valve means and said vent valve means thereby to cause said sterilizing fluid to scavenge and sterilize said point of use means, said conduit means and said gas conditioning means so as completely to sterilize all interior surfaces of said gas conditioning means, said conduit means and said point of use means.

3,893,833

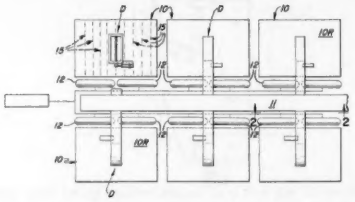
COMPARTMENTED PULSE JET DUST COLLECTOR

Edward A. Ulvestad, Naperville, Ill., assignor to Flex-Kleen Corporation, Chicago, Ill.

Filed Apr. 26, 1972, Ser. No. 247,701

Int. Cl.[2] B01D *29/28, 46/04*

U.S. Cl. 55—273 **4 Claims**



1. In a dust collector system that includes a plurality of pulse jet dust collector units for filtering operation with carrier gas at typical pulse jet air-to-cloth flow ratios; each collector unit conventionally including a dirty air plenum, a clean air plenum above the dirty air plenum, a plurality of compressed air gas distribution pipes mounted in each clear air plenum, each of said pipes having a plurality of orifices, a plurality of assemblies supported in the dirty air plenum and each comprising a conventional needled felt filter bag mounted to filter incoming carrier gas and outlet means providing an outlet passage for directing filtered air into the clean air plenum, each of said outlet means comprising a venturi nozzle, each assembly of filter bag and outlet means being in jet pulse cleaning relation to a separate one of said orifices, for directing a pulse jet through the filter bag in a direction opposite to normal can velocity flow therethrough and a plurality of first actuating means for separately controlling supply of compressed gas at a pressure from about 60 to about 100 PSIG to different ones of said pipes; and timer means for controlling actuation and sequencing of the first actuating means of all of said collector units; an improved arrangement for cleaning the filter bags for maintaining normal bag life at stable air-to-cloth flow ratios when applied to the recovery of extremely fine fume particles from a carrier gas, said arrangement including a common clean gas outlet duct, separate duct means establishing individual communications between each of said clean air plenums and said common duct, separate damper means for controlling flow of carrier gas from each of said clean air plenums through the corresponding one of each separate duct means and into said common duct, and a plurality of second actuating means each controlling one of said damper means, said timer means connecting the first and second actuating means in separate composite sets, each of said last-named sets consisting of the plurality of first actuating means corresponding to a predetermined one of said collector units and the second actuating means corresponding to the same collector unit,

said timer means including means for sequentially energizing the composite sets at time spaced intervals and means for energizing the actuating means of each composite set in a sequence wherein the corresponding damper means closes for a predetermined damper interval that is from about 20 to about 60 seconds in duration to allow the can velocity of the corresponding collector unit to become and remain minimal and wherein each of the corresponding first actuating means operates in a predetermined sequence of time spaced pulse intervals occurring at a time when the can velocity is minimal, the first pulse interval beginning about 10 seconds after the beginning of its corresponding damper interval and each pulse interval being from about 100 to about 150 milliseconds in duration and the off time between successive pulse intervals being from about one second to about 4 seconds in duration such that each pulse jet acts to dislodge the extremely fine fume particles from within a myriod of interstices in the corresponding filter bag for free fall while the can velocity remains minimal.

3,893,834

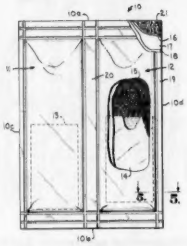
INSULATED COLD PACK

Arthur E. Armstrong, 413 Greenbrier, Moberly, Mo. 65270

Filed Mar. 4, 1974, Ser. No. 447,927

Int. Cl. F25d *5/00*

U.S. Cl. 62—4 **14 Claims**



1. In a heat exchanging package which comprises a sealed outer bag of flexible, fluid tight sheet material,

a dry heat exchanging chemical (when mixed with water) disposed within said outer bag,

a sealed water containing inner bag disposed within the outer bag,

the inner bag of smaller dimensions than the outer bag,

and the interior of the outer bag not entirely filled with air whereby an inwardly directed force applied through the outer bag of sufficient magnitude will rupture the inner bag without breaking the outer bag to effect mixing of the water and the heat exchanging chemical,

the improvement which comprises one entire side of the heat exchanging package having a sheet of aqueous liquid impervious heat insulating material integrally fixed thereto, and

a flexible aqueous liquid impervious web provided, communicating between and connecting to opposite edges of said package, whereby to form a closed loop sleeve.

3,893,835

METHOD OF GOB DISTRIBUTION

Ronnie G. Jones, and John P. Daly, both of Winchester, Ind., assignors to Maul Brothers Inc., Millville, N.J.

Division of Ser. No. 404,475, Oct. 9, 1973. This application June 19, 1974, Ser. No. 481,076

Int. Cl. C03b *5/32;* **B03b** *5/26*

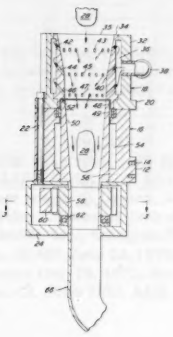
U.S. Cl. 65—122 **4 Claims**

1. A method of accelerating distribution of gobs of glass from shears to a mold in a multi-section I.S. machine comprising

a. providing a cartridge having a downwardly converging I.D. below the elevation of shears, providing said cartridge with a plurality of groups of circumferentially disposed axially spaced gas jets exiting on said converging surface,

b. creating a suction at the inlet end of said cartridge by discharge of gas through said jets into said cartridge,

c. causing a gob of glass cut by said shears to be sucked into the upper end of said cartridge and to fall downwardly through the cartridge, centering the gob with respect to said converging surface by discharge of gas through said jets, using said gas jets orientated in a manner so that they converge downwardly in the direction of flow and cause pressurized gas to build up pressure behind the gob,
d. using the gas pressure behind the gob to accelerate the speed of the gob in excess of the effect of gravity,



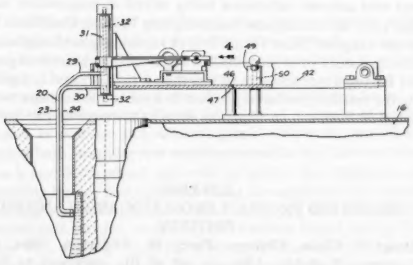
e. maintaining a positive gas pressure in a manifold chamber communicating with said jets,
f. introducing the accelerated gob into a scoop, and
g. transferring the gob from the scoop to a mold in a I.S. machine, said transferring step including moving the scoop about an upright axis so that it may direct the gob to means which transfers it to a mold.

3,893,836

ROTARY GLASSMAKING REFINE WITH DIAMETER SENSING MEANS

Robert R. Rough, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 342,291, March 16, 1973, abandoned. This application Oct. 16, 1974, Ser. No. 515,283
Int. Cl. C03b *5/18*
U.S. Cl. 65—164 **1 Claim**



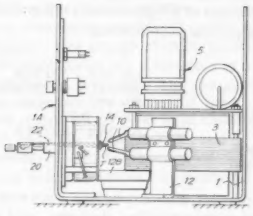
1. Apparatus for measuring the volume of molten glass in a rotating chamber comprising:
a. an open-ended rotatable chamber for receiving molten glass;
b. a probe, said probe positioned within the container so as to be within a void developed in a rotating mass of glass in the container, said probe comprising a pair of hollow tubes, a portion of each tube extending horizontally, said tubes being interconnected forming a molten glass contacting point, said tubes extending radially outwardly;
c. a manifold, said manifold connecting with said tubes to provide a continuous path for circulating cooling fluid in said tubes;
d. an arm, said arm connected with said probe, and said arm yieldingly urging the probe so as to urge the tip of the probe against the molten glass;
e. an electrical transducer, said transducer connected to the probe so that the transducer produces an electrical signal corresponding to the position of the probe;
f. means for movably positioning said probe in said container, movable freely into or out of the chamber;
g. readout means for visually displaying the position of the probe; and
h. means for circulating cooling fluids within the hollow tubes to prevent damage from contact with molten glass in the chamber.

3,893,837

EQUIPMENT FOR WELDING GLASS CAPILLARY TUBES FOR BIOLOGICAL ANALYSES

Luciano Gasbarro, Florence, Italy, assignor to Pratiga S.r.l., Florence, Italy

Filed Dec. 21, 1973, Ser. No. 427,407
Claims priority, application Italy, Dec. 22, 1972, 9814/72
Int. Cl. C03b *23/12*
U.S. Cl. 65—270 **4 Claims**



1. Laboratory equipment for the welding of capillary tubes comprising, a pair of electrodes for high voltage electric discharge; means to supply voltage to said electrodes, including a booster transformer; means for forming a seat for a piece to be welded; actuating means to impose on said means forming seat suitable motions to obtain smooth welding, said seat forming means including a member forming a tubular housing to accommodate a capillary tube to be welded, said actuating means comprising further an electric motor for the rotation of said housing, and an adjustable timer switch for controlling the actuating of said motor and simultaneously the supply of said electrodes for the generation of said electric arc.

3,893,838

HALOGENATED ESTERS AS HERBICIDE ANTIDOTES

Ferenc M. Pallos, Walnut Creek, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Nov. 16, 1972, Ser. No. 307,277
Int. Cl. A01n *9/12*
U.S. Cl. 71—100 **11 Claims**

1. The method of reducing injury to corn crops injured by thiocarbamate herbicides comprising applying to the corn seeds prior to planting a nonphytotoxic antidotally effective amount of a compound corresponding to the formula

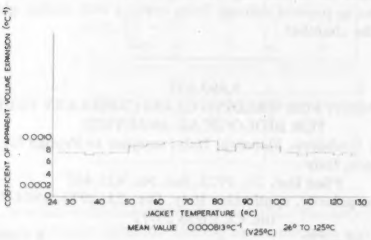
wherein R_1 is lower haloalkyl, alkynyl, alkenyl and N,N-dialkenylaminoalkyl and R_2 is lower haloalkyl.

3,893,839

TELEPHONE CABLE FILLING COMPOSITION

Frederick Cartmer Elliot, and Reginald Arthur Hunn, both of c/o Campbell Technical Waxes Limited, Thames Rd., Crayford, England

Filed Mar. 21, 1974, Ser. No. 453,191
Int. Cl. C08h 9/10
U.S. Cl. 106—272 **27 Claims**



1. A composition suitable for use in filling telecommunications cables and the like, comprising:

1. 50.0 – 70.0 percent of a high viscosity mineral oil meeting the following general specification:

Viscosity/98.8°C.	120 SUS – 220 SUS
Viscosity/37.8°C.	2000 SUS – 3500 SUS
Flash Point	204.4°C. minimum
Specific Gravity/15.6°C.	0.875 – 0.925
Color	ASTM 2 – ASTM 8
Boiling Range (at atmospheric pressure)	260°C. – 704.5°C.

2. 5.0 – 20.0 percent microcrystalline slackwax, or of an equivalent of said microcrystalline slackwax, said equivalent consisting essentially of a mixture of a microcrytalline wax with a high viscosity mineral oil having the specification recited above;

3. 3.0 – 10.0 percent of at least one wax selected from the group consisting of (a) paraffin waxes having melting points in the range of 38° – 74°C., (b) synthetic Fischer-Tropsch type waxes having melting points in the range of 71° – 120°C., and (c) natural waxes selected from the group: Beeswax, Carnauba wax, Chinese insect wax, Japan wax, Myrtle wax and Spermaceti wax;

4. 5.0 – 15.0 percent polybutene, of average molecular weight in the range of 500 – 3,500; and

5. from about 0.5 to about 8.0 percent finely divided silica of average particle size in the range of 0.0007 – 0.05 micron, said percentages of ingredients being by weight, based on the entire composition.

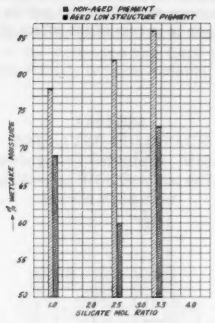
3,893,840

AMORPHOUS PRECIPITATED SILICEOUS PIGMENTS AND METHODS FOR THEIR PRODUCTION

Satish K. Wason, Havre de Grace, Md., assignor to J. M. Huber Corporation, Locust, N.J.

Filed Sept. 6, 1972, Ser. No. 286,655
Int. Cl. C09c 1/30; C08h 17/04
U.S. Cl. 106—288 B **1 Claim**

1. A new composition of matter comprising an amorphous, finely divided precipitated silica pigment having a wet cake moisture content of less than 70 percent; a surface area of less than 100 m^2/g; an oil absorption on the order of less than



125cc/100 gm; pack densities of greater than 12 pounds/cu. ft. and a valley abrasion of greater than 5.0 mg. wire loss.

3,893,841

BONE CHINA

Krishan Kumar Nijhawan, Stoke-on-Trent, and Derek Taylor, Congleton, both of England, assignors to Doulton & Co. Limited, London, England

Filed Oct. 2, 1973, Ser. No. 402,757
Claims priority, application United Kingdom, Oct. 10, 1972, 46717/72
Int. Cl. C09c 1/02
U.S. Cl. 106—306 **8 Claims**

1. A synthetic bone ash substitute suitable for use as a complete or partial replacement for bone ash in the manufacture of bone china by conventional pottery methods, being the product obtainable by (a) producing a mixture consisting essentially of a calcium phosphate and a calcium substance selected from calcium oxide and compounds which on heating decompose to form calcium oxide, said calcium phosphate and said calcium substance being mixed in proportions such that after the subsequent calcining step (b), the Ca:P ratio lies in the range of from 1:1 to 2:1; (b) calcining said mixture at a temperature of at least 900°C. so as to form a sintered product having a surface area of less than 5 $m.^2g.^{-1}$; and (c) grinding the resulting sintered product to a mean particle size in the range of from 0.5 to 10μm to obtain the required product.

3,893,842

SOLIDIFIED PRODUCT FROM MOLASSES AND SOY PROTEIN

Elmer F. Glabe, Chicago; Perry W. Anderson, Niles, and Stergios Laftsidis, Chicago, all of Ill., assignors to Food Technology, Inc., Chicago, Ill.

Division of Ser. No. 348,135, April 5, 1973, Pat. No. 3,843,821. This application July 1, 1974, Ser. No. 484,462
Int. Cl. A23l 1/08; C13f 3/00
U.S. Cl. 127—29 **3 Claims**

1. A dehydrated molasses consisting essentially of the following ingredients:

Ingredients	Parts by Weight
Molasses solids	40–60
Partially gelatinized starch of a type having a gelatinization temperature of at least 150°F.	60–0
At least partially defatted soy protein flour having a protein content of at least 45% by weight, a water soluble protein content of at least 20% by weight of the total protein content, and a weight ratio of water soluble protein to fat content of at least 1.5:1	0.25–40
Water	0.5–4.0
Emulsifier	0–1
Anti-humectant	0–1

with the further proviso that the product contains at least 0.25% by weight of said soy flour, based on the total weight of molasses solids, soy solids and starch solids.

3,893,843

METHOD FOR WASHING AND DISINFECTING HOLLOW, FLEXIBLE ARTICLES

Jack E. Fry, Dallas; Joseph C. Gerard, Arlington; Chester C. Hickman, and John E. Hummel, both of Dallas, all of Tex., assignors to Arbrook, Inc., Arlington, Tex.

Division of Ser. No. 49,407, June 24, 1970, Pat. No. 3,739,791. This application Oct. 20, 1972, Ser. No. 299,526
Int. Cl. B08b 9/00; A61l 1/00
U.S. Cl. 134—10 **2 Claims**

1. The method of decontaminating hollow flexible articles having central openings extending therethrough which comprises drivably mounting said articles for rotation in a curvalinear relation about a central axis inside a washing and disinfecting tub with at least one end of each opening facing in a direction of rotation of said tub, placing a supply of washing liquid in said tub and immersing said articles in said washing liquid bath, washing said articles by oscillating them rotatively back and forth about said axis to agitate the articles in said washing liquid, said agitation being accomplished by centrifugal and centripetal forces of said bath upon said curvalinearly positioned articles, removing the washing liquid supply from said tub, rinsing the articles in said tub and rotating them relatively rapidly in one direction to complete the removal of the rinsing liquid from said articles, transferring a supply of liquid chemical disinfectant to said tub and immersing said articles in said disinfectant for a period of time sufficient to disinfect the articles, oscillating the articles relatively back and forth about said axis to agitate the articles in said disinfectant and insure complete wetting of the internal and external surfaces of the articles with said disinfectant during the disinfectant period by the centrifugal and centripetal action of the disinfectant against the curved surfaces of said articles, removing the disinfectant supply from said tub, rinsing the articles in said tub and rotating them relatively rapidly in one direction to complete the removal of the rinsing liquid from the articles, and removing said articles from the tub to complete the decontaminating cycle.

3,893,844

DISPERSION STRENGTHENED METALS

Anil V. Nadkarni, Baltimore, Md., assignor to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 217,506, Jan. 13, 1972, Pat. No. 3,779,714. This application July 30, 1973, Ser. No. 384,028
Int. Cl. B22f 9/00
U.S. Cl. 75—0.5 R **1 Claim**

1. An improved powdered alloy suitable for dispersion strengthening by internal oxidation, comprising:

an alloy comprising a relatively noble matrix metal having a negative free energy of oxide formation at 25°C of up to 70 kilocalories per gram atom of oxygen and a solute metal having a negative free energy of oxide formation exceeding the free energy of oxide formation of said noble matrix metal by at least about 60 kilocalories per gram atom of oxygen at 25°C; and

said powdered alloy being recrystallized and having a Grain Size of at least Number 6 as measured by ASTM E-112.

3,893,845

METHOD FOR REDUCING MATTER TO CONSTITUENT ELEMENTS AND SEPARATING ONE OF THE ELEMENTS FROM THE OTHER ELEMENTS

Derek W. Mahaffey, and James E. Drummond, both of Bellevue, Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 269,634, July 7, 1972, which is a continuation-in-part of Ser. No. 172,674, Aug. 18, 1971, abandoned. This application June 1, 1973, Ser. No. 365,925
Int. Cl. C22d 7/00
U.S. Cl. 75—10 R **10 Claims**

1. A process for separating a constituent specie from the remaining species in a gas, said gas being at a temperature where the specie is partly ionized and the remaining species are insignificantly ionized, comprising:

a. flowing said gas along a magnetic field B whose field intensity increases in the general direction of gaseous flow, and the direction of said magnetic field also being in the general direction of said gaseous flow;

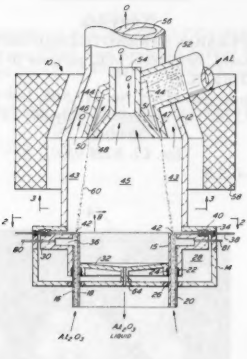
b. spacing the plasma of partly ionized specie at a position remote from the wall structure of a containing vessel as it flows along said magnetic field B;

c. applying a force F to said plasma to confine it to a region of space, said force being created by the movement of the plasma at an angle β relative to the magnetic field;

d. permitting the current J created by the interaction of the moving electrons of the ionized specie with the perpen-

dicular component of the magnetic field B to flow in a closed path;

e. using said current J flowing in a closed path to interact with the parallel component B of the magnetic field B



to generate the confining force F acting upon the partly ionized specie; and

f. collecting the partly ionized specie apart from the remaining species.

3,893,846

SLAG FORMING AGENT FOR STEEL MAKING

Masaru Takashima, Tokyo, Japan, assignor to Aikoh Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 269,045, July 5, 1972, abandoned. This application Nov. 23, 1973, Ser. No. 418,737

Int. Cl. C22b *9/10;* **C21c** *7/00*

U.S. Cl. 75—94 **4 Claims**

1. A method of forming slag during a steel making process which comprises adding to molten steel being processed a slag forming agent comprising:

a. 54 to 90 percent by weight of aluminum dross which contains more than 30 percent by weight of aluminum oxide;

b. 5 to 20 percent by weight of cement;

c. 2 to 10 percent by weight of a calcium compound selected from the group consisting of calcium carbonate, calcium hydroxide and mixtures thereof;

d. 1 to 15 percent by weight of a chloride compound selected from the group consisting of magnesium chloride, sodium chloride and mixtures thereof; and

e. from about 1 to about 7 percent by weight of water.

3,893,847

COMPOSITION OF MATTER AND PROCESS

Arthur Percy Derrick, Sylvania, Australia, assignor to Catoleum Pty. Limited, Botany, Australia

Filed July 19, 1971, Ser. No. 164,149

Claims priority, application Australia, Aug. 7, 1970, 2107/70

Int. Cl. C04b *25/00;* **C22b** *1/14*

U.S. Cl. 75—3 **4 Claims**

1. A process of manufacturing indurated agglomerates which process comprises mixing a finely ground mineral in the size range from 10 to 1,000 microns with an aqueous solution of from 0.001 to 10 lbs. polymer per ton of said finely ground mineral, said polymer being a substantially straight chain water soluble polymer having a molecular weight from 1,000,000 to 20,000,000, treating the resultant mixture to form green agglomerates and indurating said green agglomerates by heating.

3,893,848

VALVE SEAT MATERIAL FOR INTERNAL COMBUSTION ENGINES AND THE SIMILAR MATERIAL

Kenya Motoyoshi, Itami, and Makoto Osawa, Tokyo, both of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Division of Ser. No. 177,719, Sept. 3, 1971, Pat. No. 3,834,898. This application Nov. 12, 1973, Ser. No. 415,192

Claims priority, application Japan, Sept. 3, 1970, 45-77402; Nov. 11, 1970, 45-98655The portion of the term of this patent subsequent to Sept. 10, 1991, has been disclaimed.

Int. Cl. C22c *39/54*

U.S. Cl. 75—122 **2 Claims**

1. A valve seat material for an internal combustion engine consisting of an alloy matrix consisting essentially of 0.5–30 weight % Cr, 0.1–3.0 weight percent carbon, about 5 to 45 weight percent copper and iron as the balance, and having dispersed in said matrix from about 0.3 to about 10 weight percent of a member selected from the group consisting of Pb and a Pb oxide or sulfate and from 1 to 10 weight percent of a low melting point glass.

3,893,849

OXIDATION-RESISTANT FERRITIC STAINLESS STEEL

Kenneth G. Brickner, Pittsburgh, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 30, 1970, Ser. No. 85,738

Int. Cl. C22c *39/02*

U.S. Cl. 75—124 **1 Claim**

1. A ferritic stainless steel consisting essentially of

carbon	0.03% max.
manganese	0.50% max.
silicon	0.10% max.
phosphorus	0.025% max.
sulfur	0.025% max.
chromium	2.75 to 5.0%
aluminum	5.0 to 7.0%
molybdenum	about 1%
iron	balance plus incidental impurities,

wherein the percent chromium plus two times the percent molybdenum is at least equal to the integer 5, said steel characterized by high-temperature oxidation resistance at all temperatures up to about 2,200°F, and sufficient ductility to be hot and cold worked into sheet and strip products.

3,893,850

NICKEL FREE AUSTENITIC STAINLESS STEELS

Kazuo Hoshino, and Koutaro Morita, both of Yamaguchi, Japan, assignors to Nisshin Steel Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 97,494, Dec. 14, 1970, abandoned. This application Mar. 26, 1973, Ser. No. 344,509

Claims priority, application Japan, Apr. 30, 1970, 45-36324

Int. Cl. C22c *39/26, 39/54*

U.S. Cl. 75—125 **7 Claims**

1. Substantially nickel free austenitic stainless steels with excellent formability and corrosion resistance, consisting essentially of 0.06 to 0.15% of C, 0.3 to 1.0% of Si, 13 to 16% of Cr, 7.55 to 10.19% of Mn, 0.05 to 0.15% of N, and 1.0 to 4.0% of Cu and the balance of Fe as the essential ingredients.

3,893,851
CORROSION-RESISTANT ALLOYS

John H. Culling, Kirkwood, Mo., assignor to Carondelet Foundry Company, St. Louis, Mo.

Filed Sept. 11, 1974, Ser. No. 505,003
Int. Cl. C22c *19/00*
U.S. Cl. 75—171 **6 Claims**

1. An air-meltable, castable, workable low hardness alloy resistant to corrosion by sulfuric acid over a wide range of acid concentrations consisting essentially of between about 50.18 and about 55.48% by weight nickel, between about 33.20 and about 35.15% by weight chromium, between about 3.23 and about 3.85% by weight molybdenum, between about 2.85 and about 3.86% by weight copper, up to about 1.50% by weight silicon, up to about 2.50% by weight manganese, up to about 1.00% by weight titanium, up to about 1.00% by weight niobium, up to about 1.00% by weight tantalum, up to about 0.01% by weight boron, up to about 0.30% by weight of a rare earth component selected from the group consisting of cerium, lanthanum and misch metal, carbon in a proportion between 0 and a maximum which is the greater of 0.08% by weight and the sum of

$$\frac{[Ti]}{5} + \frac{[Nb]}{8} + \frac{[Ta]}{16}$$

where

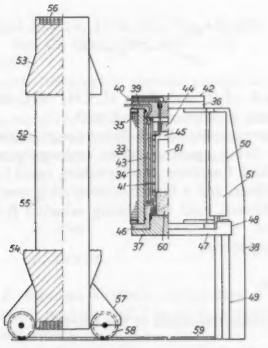
[Ti] = the titanium content
[Nb] = the niobium content
[Ta] = tantalum content

the sum of the tantalum content and the niobium content being no greater than about 1.00% by weight, and the balance essentially iron.

3,893,852
METHOD OF MANUFACTURING BILLETS FROM POWDER

Carl Bergman; Nils Ivar Landgren; Hans Gunnar Larsson, all of Vasteras, and Torsten Strandberg, Soderfors, all of Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed June 5, 1973, Ser. No. 367,105
Claims priority, application Sweden, June 12, 1972, 7685/72
Int. Cl. B22f *1/00*
U.S. Cl. 75—224 **1 Claim**



1. In a method of manufacturing high-speed steel from metal powder which comprises enclosing powder or a green body shaped of powder in a container, heating the container with its contents and subjecting the container to a high, all-sided fluid pressure in a pressure furnace at such a temperature that the powder body is bonded together and a solid body is formed, the steps of degassing the container and powder therein and, after degassing, supplying to the container gas consisting essentially of nitrogen, said gas acting during the subsequent heating as a heat transfer agent circulating within the container, heating the container with the gas therein, and subjecting the closed, heated container to a pressure which is required for bonding at a selected pressing temperature, said nitrogen being included as a constituent in the manufactured material.

3,893,853
PROCESS OF PREPARING PHOTOCONDUCTIVE POLY--VINYL-CARBAZOLE TYPE CHARGE-TRANSFER COMPLEXES

Kenji Nukina, Showa, and Yoshi Arai, Oyama, both of Japan, assignors to Dainippun Ink & Chemicals Inc., Tokyo and Dainippun Ink Institute of Chemical Research, both of, Japan

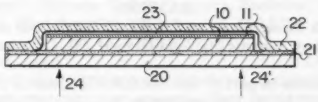
Continuation of Ser. No. 260,191, June 6, 1972, abandoned. This application June 10, 1974, Ser. No. 478,054
Claims priority, application Japan, Jan. 8, 1972, 47-4457
Int. Cl. G03g *5/06*
U.S. Cl. 96—1.5 C **6 Claims**

1. A process of preparing a charge-transfer complex with improved photoconductivity which comprises reacting 100 parts by weight of poly-N-vinylcarbazole with 30 – 220 parts by weight of tetranitro-9-fluorenone for a period of 1 to 10 hours at a temperature of from 50° to the reflux temperature in a solvent of a chlorinated hydrocarbon-ketone mixture having a 9:1 – 4:6 volume ratio, said poly-N-vinylcarbazole being used in an amount of 2 – 15% by weight based on the solvent.

3,893,854
PHOTOGRAPHIC ARTICLES WITH GAPS FOR PROCESSING FLUIDS

Satoru Honjo, Asaka, Japan, and Masamichi Sato, Tucson, Ariz., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 30, 1973, Ser. No. 346,481
Int. Cl. G03g *5/00, 7/00;* **G03C** *5/04;* **G03c** *5/24, 1/58, 5/22, 5/34, 5/24, 1/76, 1/48, 3/00*
U.S. Cl. 96—1.5 **8 Claims**



1. A photographic member comprising a photosensitive element having a supporting layer, a substrate contiguous with said supporting layer, a photosensitive layer on the free surface of said substrate and a transparent film associated with said photosensitive layer whereby a gap is formed therebetween,

the side edges of said supporting layer extending beyond the side edges of the photosensitive layer and the substrate, and the transparent film being bonded to the surface of said supporting layer which extends beyond the side edges of the photosensitive layer and the substrate.

3,893,855

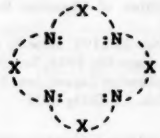
PHOTOGRAPHIC LIGAND FOR INDUCING DISPROPORTIONATION OF SILVER +1 AND PROCESSES OF USE THEREOF

John C. Charkoudian, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 327,797, Jan. 29, 1973, abandoned. This application June 3, 1974, Ser. No. 475,778
Int. Cl. G03c 7/00, 5/54, 1/48
U.S. Cl. 96—3 31 Claims

27. A silver diffusion transfer photographic process which comprises, in combination, the steps of:

a. exposing a photographic film unit comprising photosensitive silver halide and silver precipitating nuclei wherein said silver halide has associated therewith a non-aromatic macrocyclic ligand having four electron donor atoms of the formula:



wherein each X is a carbon chain of at least two carbon atoms; and

b. contacting said exposed film unit with a processing composition containing a silver halide developing agent and a silver halide solvent, thereby providing a visible diffusion transfer process silver image to said unit, as a function of the point-to-point degree of exposure thereof.

29. A diffusion transfer color photographic process as defined in claim 27 wherein said film unit includes a color screen and exposure of said film unit is accomplished by radiation transmitted through said screen.

3,893,856

METHOD OF PRODUCING GEOMETRIC OPTICAL RASTERS

Friedrich Bestenreiner, and Reinhold Deml, both of Munich, Germany, assignors to Agfa-Gevaert AG, Leverkusen, Germany

Continuation-in-part of Ser. No. 830,073, June 3, 1969, Pat. No. 3,775,110. This application Nov. 26, 1973, Ser. No. 418,818
Claims priority, application Germany, June 4, 1968, 1772567The portion of the term of this patent subsequent to Nov. 27, 1990, has been disclaimed.
Int. Cl. G03c 5/00, 11/00
U.S. Cl. 96—38.3 4 Claims

1. A method of producing a geometric optical raster which comprises the steps of forming a ray of coherent light; splitting said ray into a plurality of rays; deflecting and overlapping said plurality of rays to form an interference pattern; exposing selected areas of a layer of photosensitive material to said interference pattern, including directing light against said layer through at least one confined area, periodically varying the intensity of light, and effecting relative movement at a constant speed between said confined area and said layer; and stabilizing said layer.

3,893,857

PHOTOGRAPHIC TIN AMPLIFICATION PROCESS

John E. Wyman, Lexington, Mass., assignor to Itek Corporation, Lexington, Mass.

Continuation of Ser. No. 743,982, July 11, 1968, abandoned. This application Sept. 25, 1972, Ser. No. 291,843
Int. Cl. G03c 5/24, 5/26
U.S. Cl. 96—48 PD 9 Claims

1. Process of amplifying a metal image on a photographic medium which image is capable of initiating deposition of free tin when contacted with a physical developer comprising a solution of stannous ions, and which comprises contacting said medium with a source of stannous ions and then in a separate step contacting the medium with a source of chromous ions as reducing agent for said stannous ions.

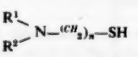
3,893,858

PHOTOGRAPHIC BLEACH ACCELERATORS

Herbert E. Wabnitz, Jr., Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

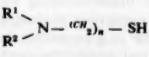
Filed Mar. 26, 1973, Ser. No. 345,148
Int. Cl. G03c 5/32, 7/16
U.S. Cl. 96—60 R 23 Claims

1. An improved method of photographic processing in which an imagewise exposed and color developed photographic element is contacted with a ferric aminopolycarboxylic acid complex which functions as a bleaching agent to oxidize photographic silver and with a thiosulfate which functions as a fixing agent, wherein the improvement comprises contacting said element, subsequent to color development and prior to or simultaneously with the contact with said bleaching agent, with a bleach-accelerating amount of a thiol or a salt thereof, said thiol being selected from the group consisting of monothioglycerol,
cystine,
cystamine,
cysteine,
and aminoalkylenethiols of the formula:



wherein each of R^1 and R^2 is H, CH_3 or C_2H_5 and n is an integer having a value of from 1 to 3.

10. A photographic bleach-fixing composition containing a thiosulfate fixing agent, a ferric aminopolycarboxylic acid complex which functions as a bleaching agent to oxidize photographic silver, and a bleach-accelerating amount of a thiol or a salt thereof, said thiol being selected from the group consisting of
monothioglycerol,
cystine,
cystamine,
cysteine,
and aminoalkylenethiols of the formula:



where each of R^1 and R^2 is H, CH_3 or C_2H_5 and n is an integer having a value of from 1 to 3.

3,893,859
4-ARYL-1-CARBAMOYL-2-TETRAZOLINE-5-THIONE STABILIZER PRECURSOR IN A HEAT STABILIZABLE PHOTOGRAPHIC ELEMENT

Donald M. Burness; Hans G. Ling, and Ronald H. Ericson, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 23, 1974, Ser. No. 435,806
Int. Cl. G03c *5/24*
U.S. Cl. 96—61 R **38 Claims**

10. In a photothermographic element comprising a support having thereon a layer comprising

a. photosensitive silver halide,

b. an oxidation-reduction image-forming combination comprising

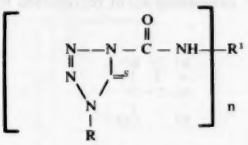
i. a silver salt oxidizing agent with

ii. a reducing agent,

c. a polymeric binder, and

d. a thione, image stabilizer precursor, the improvement wherein said stabilizer precursor comprises a 4-aryl-1-carbamoyl-2-tetrazoline-5-thione.

20. A photographic composition comprising (a) photosensitive silver halide, (b) a stabilizer precursor represented by the formula:



wherein R is aryl containing 6 to 12 carbon atoms and R^1 is alkyl containing 1 to 12 carbon atoms, aryl containing 6 to 12 carbon atoms, cycloalkyl containing 3 to 8 carbon atoms when *n* is 1; or alkylene containing 1 to 6 carbon atoms when *n* is 2; *n* is 1 or 2; and (c) a polymeric binder.

3,893,860
PHOTOTHERMOGRAPHIC ELEMENT AND PROCESS

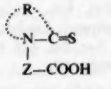
Richard C. Sutton, and Heinz E. Stapelfeldt, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed July 16, 1974, Ser. No. 489,029
Int. Cl. G03c *5/30, 1/04, 1/72*
U.S. Cl. 96—66 T **17 Claims**

1. In a photothermographic element comprising a support having thereon (I):

a. photographic silver halide in association with

b. a silver salt of a heterocyclic thione, said heterocyclic thione being represented by the formula:



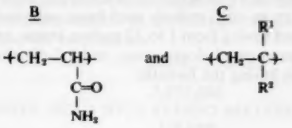
(XX)

wherein R represents atoms completing a 5-member heterocyclic nucleus and Z is alkylene containing 1 to 30 carbon atoms,

c. an organic reducing agent for said silver salt of a heterocyclic thione, and

d. a polymeric, synthetic binder and

contiguous to (I), at least one polymer layer (II), the improvement wherein said polymer layer (II) comprises at least 50% by weight of a polymer (A) comprising the repeating units represented by the formulas:



wherein:

R^1 is hydrogen or alkyl containing 1 to 4 carbon atoms;

R^2 is an imidazolyl, N-substituted carbamoyl, 2-pyrrolidonyl, acetoacetoxyethoxycarbonyl, acetoacetonylmethylphenyl, ethoxycarbonylaceto, pyridyl, hydroxy, hydroxyalkyl containing 1 to 4 carbon atoms, carboxy, carboxyethoxycarbonyl, a heterocyclic ammonium salt group having a 5- or 6-membered azonia nitrogen-containing ring, or a pyridinium salt group, and

the weight ratio of starting monomers for said units B and C is, respectively, about 60:40 to 100:0.

3,893,861
SILVER HALIDE PHOTOSENSITIVE MATERIAL

Motoo Kogure; Yasuji Muroi; Kiyoyuki Miura, and Motoo Watanabe, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Sept. 24, 1973, Ser. No. 400,237
Claims priority, application Japan, Sept. 28, 1972, 47-96592
Int. Cl.² G03C *1/72*
U.S. Cl. 96—67 **7 Claims**

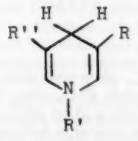
6. A silver halide photosensitive material according to claim **5**, wherein said group consists of methyl methacrylate, methyl acrylate, ethyl acrylate, diacetone acrylate, diacatone methacrylate, 2-chloroethylacrylate, 2-chloroethyl methacrylate, chloromethyl acrylate, chloromethyl methacrylate, glycidyl acrylate, glycidyl methacrylate, acrylamide, N-phenyl-acrylamide, N-alkylacrylamide, diacetone acrylamide, diacetone methacrylamide, N,N-ethyl-eneimino-acylamide, N-methoxymethyl-acrylamide, N-ethoxy methylacrylamide, N-butoxymethyl-acrylamide, N-hydroxy methyl acrylamide, styrene, P-chloromethylstyrene, P-formylstyrene, P-acetylstyrene, P-benzoylstyrene, vinyl acetate, vinyl chloroacetate, methylvinylether, acrylic acid, itaconic acid, maleic anhydride, acrolein, vinylmethylketone, vinylethylketone, vinylphenylketone, vinylalcohol, vinyl chloride, vinylidene chloride, allyl chloride, acrylonitrile, and methacrylonitrile.

3,893,862
REDUCED PYRIDINE COMPOUNDS

Jal F. Munshi, and Richard L. White, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

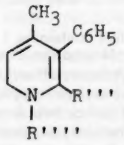
Filed Sept. 24, 1973, Ser. No. 400,276
Int. Cl. G03c *5/30, 1/48*
U.S. Cl. 96—66.3 **24 Claims**

1. An alkaline photographic developer composition for silver halide comprising an aromatic silver halide developing agent and a reduced pyridine compound selected from the class consisting of 1,4-dihydropyridine compounds having the formula:



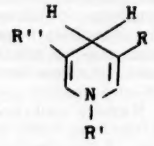
wherein R is a carbamoyl radical, a carboxyalkyl radical having from 1 to 8 carbon atoms, an alkoxycarbonyl radical having from 1 to 8 carbon atoms, an acyl radical having from

1 to 8 carbon atoms, a cyano radical or a halogen atom; R′ is an aryl radical or an alkyl radical, each being substituted or unsubstituted and having from 1 to 12 carbon atoms; and R″ is a hydrogen atom or a halogen atom, and 1,2-dihydropyridine compounds having the formula:

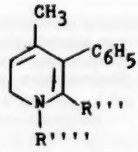


wherein R‴ and R⁗, taken separately, are each an aliphatic radical of not more than five carbon atoms that is selected from the group consisting of an alkyl radical, a chloroalkyl radical, a bromoalkyl radical, a hydroxyalkyl radical, a carboxymethyl radical, a carbalkoxymethyl radical and an alkoxy alkyl radical and R‴ and R⁗, taken together, are the atoms necessary to form a 5-6 member heterocyclic ring containing an O, N or S atom.

13. A photographic image forming composition comprising silver halide and a reduced pyridine compound selected from the class consisting of 1,4-dihydropyridine compounds having the formula:



wherein R is a carbamoyl radical, a carboxyalkyl radical having from 1 to 8 carbon atoms, an alkoxycarbonyl radical having from 1 to 8 carbon atoms, an acyl radical having from 1 to 8 carbon atoms, a cyano radical or a halogen atom; R′ is an aryl radical or an alkyl radical, each being substituted or unsubstituted and having from 1 to 12 carbon atoms; and R″ is a hydrogen atom or a halogen atom, and 1,2-dihydropyridine compounds having the formula:



wherein R‴ and R⁗, taken separately, are each an aliphatic radical of not more than five carbon atoms that is selected from the group consisting of an alkyl radical, a chloroalkyl radical, a bromoalkyl radical, a hydroxyalkyl radical, a carboxymethyl radical, a carbalkoxymethyl radical and an alkoxy alkyl radical and R‴ and R⁗, taken together, are the atoms necessary to form a 5-6 member heterocyclic ring containing an O, N or S atom.

3,893,863

PHOTOGRAPHIC ELEMENTS, COMPOSITIONS AND PROCESSES

Burton D. Wilson; Paul E. Woodgate, both of Rochester, and Richard W. Henn, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 252,036, May 10, 1972. This application July 3, 1974, Ser. No. 485,405

Int. Cl. G03c *1/06, 1/02*

U.S. Cl. 96—95 **25 Claims**

1. A photosensitive composition comprising a photosensitive silver salt and an N-hydroxyurea silver halide developing agent represented by the following formula:

wherein R¹, R², and R³ individually represent hydrogen, alkyl containing 1 to 4 carbon atoms or aryl containing 6 to 10 carbon atoms.

5. A photosensitive silver halide emulsion comprising photosensitive silver halide, a polymeric binder and an N-hydroxyurea silver halide developing agent represented by the following formula:

wherein R¹, R², and R³ individually represent hydrogen, alkyl containing 1 to 4 carbon atoms or aryl containing 6 to 10 carbon atoms.

12. A photothermographic element comprising a support having thereon (a) photographic silver salt in association with (b) an oxidation-reduction image-forming combination comprising (i) an oxidizing agent with (ii) an N-hydroxyurea reducing agent and (c) a polymeric binder, said N-hydroxyurea reducing agent being represented by the following formula:

wherein R¹, R², and R³ individually present hydrogen, alkyl containing 1 to 4 carbon atoms or aryl containing 6 to 10 carbon atoms.

3,893,864

QUICK-CURING WATER RESISTANT SILICA-ALKALI METAL COATINGS AND PROCESSES THEREFOR

Ronald Wentworth Beers, Spring, Tex., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Dec. 20, 1973, Ser. No. 426,438

Int. Cl. C09d *5/10*

U.S. Cl. 106—1 **18 Claims**

1. A liquid composition especially well adapted to function as a vehicle from which especially fast-curing water-resistant coatings can be obtained comprising in combination:

I. 10 to 45 percent by weight of solids comprising:

A. From about 10 to 60 weight percent solids of fugative NH_4^+ ion stabilized colloidal silica based on total silica solids in said composition:

B. The 90 to 40 weight percent balance of silica solids comprising silica or silicate containing materials: selected from the group consisting essentially of:

1. Organic quaternary ammonium silicates;
2. Alkali stabilized colloidal silicates;
3. Alkali metal silicates selected from the group consisting of:
   a. potassium silicates
   b. lithium silicates
   c. sodium-lithium silicates and;
4. Mixtures of the foregoing

II. 90 to 55 weight percent of water.

3,893,865

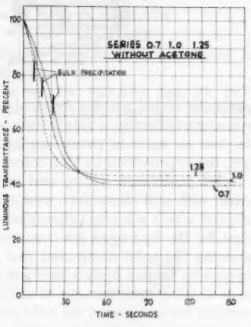
METHOD FOR STABILIZING A CHEMICAL FILMING COMPOSITION

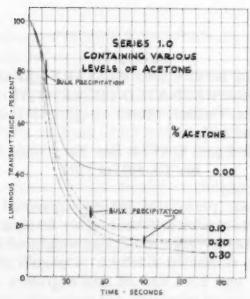
Helmut Franz, Oakmont, and David E. Lecoco, New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 111,904, Feb. 2, 1971. This application Nov. 28, 1972, Ser. No. 310,066

Int. Cl. C23c *3/02*

U.S. Cl. 106—1 **19 Claims**





1. In a method for stablizing an aqueous chemical filming composition comprising (a) a water soluble compound of a reducible metal selected from the group consisting of nickel, cobalt and iron and mixtures of such compounds in an effective amount to deposit a film on a substrate when reduced in contact therewith; and (b) a borohydride reducing agent for the contemplated metal in an effective amount to reduce the water soluble, reducible metal; wherein the filming composition is capable of depositing a film on a sensitized substrate and is characterized by its instability due to bulk precipitation; the improvement comprising the addition of a mono-carbonyl containing compound having an active carbonyl selected from the group consisting of ketones, condensed ketones, and mixtures thereof in an effective amount to stabilize the composition against bulk precipitation of the reducible metal while permitting the composition to retain its capability of depositing a film on a sensitized substrate at a rate that is substantially undiminished relative to the effective deposition rate of the unimproved composition.

3,893,866

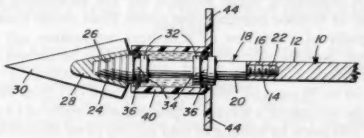
ARROW HEAD WITH FLUENT MATERIAL RELEASE MEANS

Jimmy D. Hollingsworth, Rt. 2, Florence, Miss. 39073

Filed Feb. 12, 1974, Ser. No. 441,843

Int. Cl. F41b *5/02*; **A61m** *5/00*

U.S. Cl. 273—106.5 R **3 Claims**



1. A projectile for injecting fluent materials, said projectile including an elongated shank having front and rear ends, the front end portion of said shank including a sharpened head, said shank, rearward of said head including a generally cylindrical portion provided with a zone of reduced diameter intermediate its opposite ends with the opposite ends of said cylindrical portion defining zones of greater diameter than said zone of reduced diameter, a sleeve member having its opposite ends slidingly telescoped over at least adjacent portions of said zones of greater diameter and defining an annular chamber for receiving fluent material within said sleeve about said zone of reduced diameter, said sleeve, at least slightly spaced from the forward end thereof, including a laterally outwardly projecting abutment for engagement with a target penetrated by said sharpened head to terminate forward movement of said sleeve and allow said zone of reduced width to advance relative to said sleeve upon further penetration of said target by said head and shank, said zones of greater diameter including seal means extending thereabout slidingly and sealingly engaged with the inner surfaces of said sleeve, said head including a rear end portion immediately forward of the forward end of said sleeve, said rear end portion of said head being circular in crosssection and of a diameter at least closely equal to the outside diameter of said sleeve.

3,893,867

MAGNESIA-BASE SINTERED ARTICLE AND PROCESS FOR PRODUCING THE SAME

Kiyoshi Ogasawara; Gentaro Kokubo, both of Tokyo, and Takashi Hojo, Yokohama, all of Japan, assignors to Nihon Kaisuikako Co., Ltd., Tokyo, Japan

Filed Oct. 25, 1973, Ser. No. 409,472

Claims priority, application Japan, Oct. 25, 1972, 47-106161

Int. Cl. C04b *35/04*

U.S. Cl. 106—58 **16 Claims**

1. A process for producing a light and porous magnesia-base sintered article comprising blending a finely divided first component selected from the group consisting of magnesia and a substantially homogeneous mixture of magnesia and calcium oxide containing at least 70 % by weight of magnesia, with a finely divided second component selected from the group consisting of magnesium hydroxide and a substantially homogeneous mixture of magnesium hydroxide with calcium hydroxide containing at least 70 % by weight of magnesium hydroxide, to form a uniformly blended mixture containing from 20 to 90 % by weight of said first component and the balance of said mixture consists essentially of said second component, forming the thus-blended mixture into a shaped article and calcining the article at a temperature in the range of from about 1,400°C to about 2,000°C to form a sintered product.

3,893,868
SEPARATION AGENT FOR MOLDED POLYURETHANE FOAMS

Gunter Klement, Dusseldorf-Holthausen; Horst Baumann, Leichlingen, and Eugen Scheidt, Dusseldorf-Holthausen, all of Germany, assignors to Henkel & Cie GmbH, Dusseldorf, Germany

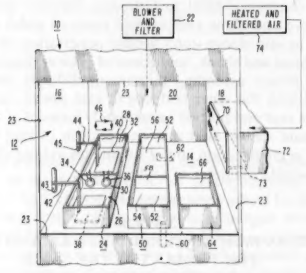
Filed Oct. 29, 1973, Ser. No. 410,521
Claims priority, application Germany, Nov. 11, 1972, 2255310
Int. Cl. C08g *9/00*
U.S. Cl. 106—38.24 **11 Claims**

1. A separating agent solution for the facilitating of the release of molded polyurethane foams from molds consisting essentially of a solution of a neutral magnesium salt of an aliphatic α-sulfocarboxylic acid having 8 to 26 carbon atoms in an aqueous solvent mixture consisting essentially of (I) from 30 to 70 parts by volume of water and (II) from 70 to 30 parts by volume of a solvent consisting essentially of (A) from 50 to 100 parts by volume of said solvent of an alkanol having 1 to 4 carbon atoms and (B) from 0 to 50 parts by volume of said solvent of an alkanone having 3 to 4 carbon atoms.

3,893,869
MEGASONIC CLEANING SYSTEM

Alfred Mayer, Plainfield, and Stanley Scwartzman, Somerville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 31, 1974, Ser. No. 475,173
Int. Cl. B08b *3/04*
U.S. Cl. 134—86 **9 Claims**



1. Apparatus for cleaning a surface of an article comprising: a dust-free compartment having an opening communicating with the ambience,

air pressure means cooperatively associated with said compartment to maintain air pressure within said compartment slightly higher than in said ambience, whereby a laminar flow of air proceeds from said compartment into said ambience,

a first container for a first cleaning fluid for said article,

a transducer adapted to oscillate at a frequency of between 0.2 and 5 MHz for propagating a beam of ultrasonic energy along a predetermined direction disposed in said first container,

means within said first container for disposing said article with said surface substantially parallel to said propagated beam within said first container,

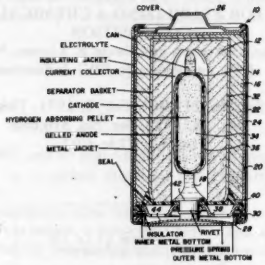
means for a liquid rinse for rinsing said surface of said article after it is removed from said first container, and

means communicating with said compartment for drying said article when removed from said liquid rinse.

3,893,870
HYDROGEN ABSORBING MATERIAL FOR ELECTROCHEMICAL CELLS

Akiya Kozawa, Middleburg Heights, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 268,785, July 3, 1972, which is a continuation of Ser. No. 853,311, Aug. 27, 1967, abandoned. This application June 14, 1973, Ser. No. 369,866
Int. Cl. H01m *1/08*
U.S. Cl. 136—107 **3 Claims**



1. In a hermetically sealed electrochemical cell having a central, hollow current collector, a zinc anode, a manganese dioxide cathode, and an aqueous potassium hydroxide solution as electrolyte, the improvement which comprises a hydrogen absorbing pellet positioned within said hollow current collector in contact with said electrolyte, said pellet comprising a solid compound which will react chemically with hydrogen gas, a catalyst for the hydrogen gas consuming reaction, a binder for retaining the solid compound and catalyst in a discrete, self-supporting shaped body which will be porous to hydrogen gas so as to allow hydrogen gas to circulate through said body and contact the surfaces of the solid compound and catalyst, and an outer sheath encasing said body which is permeable to hydrogen gas but impermeable to the electrolyte of the cell.

3,893,871
PHENOLIC RESIN AND BATTERY SEPARATOR IMPREGNATED THEREWITH

Robert T. Jones, Pelham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 9, 1974, Ser. No. 432,028
Int. Cl. H01m *3/02*
U.S. Cl. 136—146 **11 Claims**

1. A cellulosic permeable battery separator which comprises a cellulosic substrate thoroughly impregnated with a resole of number average molecular weight of between 130 and 300 and a combined aldehyde to phenol molar ratio of between 1.6:1 and 2.8:1 and an anti-migratory agent for reducing the degree of migration and improving oxidative resistance selected from the group consisting of phenol, o-, m-, and p-cresol, hydroquinone and catechol, wherein the weight ratio of resole to anti-migratory agent is between 100:7 and 100:32 and wherein the resole is advanced to an infusible state.

3,893,872
OXALIC ACID TREATMENT OF FOIL

Ehrlich M. Eiland, Lower Burrell, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 21, 1972, Ser. No. 317,106
Int. Cl. C23f *7/00*
U.S. Cl. 148—6.14 A **4 Claims**

1. A process for improving the susceptibility of aluminum foil for adhesion of coatings applied thereto which comprises treating as-rolled foil with from about 0.05 mg/ft² to about 0.30 mg/ft² oxalic acid to replace residual lubricant on the

surface of said foil therewith and thereafter heating the treated foil to a temperature of from 100° to 750°F, thereby removing said acid from said surface by volatilization and improving its susceptibility to adherence of inks and lacquers thereto.

3,893,873

METHOD FOR MANUFACTURING SPHEROIDAL GRAPHITE CAST IRON

Kenichi Hanai, Urawa, and Tsukasa Fukumura, Okaya, both of Japan, assignors to Nippon Kinzoku Co. Ltd. and Teikoku Piston Ring Co. Ltd., both of Tokyo, Japan

Filed May 7, 1973, Ser. No. 358,028
Int. Cl. C21d *5/00*
U.S. Cl. 148—12 R **4 Claims**

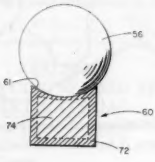
1. A method for manufacturing spheroidal graphite cast iron comprising applying hot plastic deformation treatment to a spherical graphite cast iron at a reduction ratio of 30 to 80% and subsequently subjecting the said material to heat treatment to obtain high tensile strength.

3,893,874

CAMS

James M. Denker, Scituate, Mass., assignor to Nutron Corporation, Hingham, Mass.

Division of Ser. No. 327,651, Jan. 29, 1973, Pat. No. 3,848,481. This application Apr. 25, 1974, Ser. No. 464,135
Int. Cl. C21d *1/00, 1/06;* **C23d** *11/12*
U.S. Cl. 148—12.1 **10 Claims**



1. The method of making a longitudinally-extending cam track including the steps of:

case-hardening a cam to provide a case-hardened layer of relatively high yield point material overlying a core of relatively low yield point material, said layer being of substantially uniform thickness in transverse cross-section and underlying and defining a surface of the cam; and,

removing a central longitudinally-extending portion of said layer to form said cam track,

the remaining portions of the layer defining portions of said cam track and being of greater thickness along the sides than along the center of the track.

3,893,875

METHOD OF MAKING A LUMINESCENT DIODE

Naozo Watanabe, Tokyo; Kunio Kaneko, and Masasi Dosen, both of Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 27,794, April 13, 1970, Pat. No. 3,689,330. This application Mar. 21, 1972, Ser. No. 236,695
Claims priority, application Japan, Apr. 18, 1969, 44-30117
Int. Cl. H01l *7/38*
U.S. Cl. 148—172 **3 Claims**

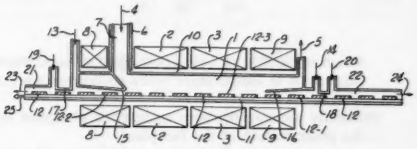
1. A method of making a luminescent diode comprising the steps of providing a gallium phosphide substrate having an impurity donor of a first type therein and a melt of gallium-gallium phosphide solution, heating said substrate and said melt to the temperature range 1,050° to 1,200°C to render said melt a solution, passing a carrier gas of hydrogen containing hydrogen sulfide and ammonia over said melt and said substrate to cause the same to be reacted with said melt to diffuse sulfur and nitrogen thereinto and growing an epitaxial layer of gallium phosphide on said gallium phosphide substrate from said melt of gallium-gallium phosphide solution, and further including the step of producing zinc vapor over said substrate as said epitaxial layer is grown by heating zinc to a temperature range of 600°–620°C.

3,893,876

METHOD AND APPARATUS OF THE CONTINUOUS PREPARATION OF EPITAXIAL LAYERS OF SEMICONDUCTING III-V COMPOUNDS FROM VAPOR PHASE

Shin-Ichi Akai; Makoto Hayashi; Shin-Ichi Iguchi, and Takashi Shimoda, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Aug. 31, 1972, Ser. No. 285,379
Claims priority, application Japan, Sept. 6, 1971, 46-68658
Int. Cl. H01l *7/36;* **C23c** *11/00*
U.S. Cl. 148—175 **4 Claims**



1. A method for the continuous preparation of the epitaxial layers of a III-V ternary compound semiconductor represented by a general formula $AB_{1-x}C_x$ on a III-V binary compound semiconductor from a gas mixture, wherein $AB_{1-x}C_x$ stands for both $A^{III}B^{V}_{1-x}C^{V}_{x}$ and $B^{III}_{1-x}C^{III}_{x}A^{V}$, A^{III} and A^{V} being a III-B element and a V-B element, respectively, and B^{III} and C^{III} and B^{V} and C^{V} being two different III-B elements and V-B elements, respectively, and the value of x being between 0 and 1, wherein said III-V ternary compound semiconductor with a graded composition is grown without changing timewise the composition of said gas mixture entering into the reaction furnace, which is given a temperature gradient decreasing with distance in the direction of the gas flow, and by gradually changing the temperature of said III-V binary compound semiconductor, and which is characterized by continuously changing the value of x to result in the graded composition by continuously moving the plurality of said III-V binary compound semiconductor substrates, upstream of said gas flow in the situation when the substrate has a lower melting point, and downstream of said gas flow in the situation when the substrate has a higher melting point than said ternary compound semiconductor, respectively, thus effectively growing said epitaxial layers on said substrates thereby gradually decreasing the constituent C and increasing the consituent B in the gas mixture in the reaction furnace downstream of said gas flow in the situation when the compound AB has a lower melting point than the compound AC and vice versa in the situation when the compound AB has a higher melting point than the compound AC.

3,893,877

METHOD AND STRUCTURE FOR METALIZING A CATHODE RAY TUBE SCREEN

Philomena C. Libman, Mt. Prospect, and William E. Wainscott, Morton Grove, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

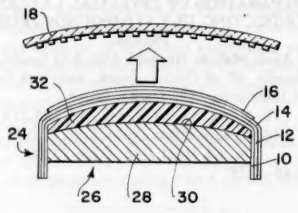
Filed Jan. 2, 1974, Ser. No. 429,603
Int. Cl. B29 *3/00, 27/00;* **H01j** *9/00*
U.S. Cl. 156—80 **5 Claims**

1. A method for metalizing a phosphor screen on the faceplate of a cathode ray tube, comprising:

depositing on the inner surface of a cathode ray tube faceplate a phosphor layer containing a phosphor material and a photosensitized binder;

draping over a mandril having generally the contour of the inner surface of the cathode ray tube faceplate a web comprising a flexible and deformable sheet substrate, a release agent deposited on the substrate, and a layer of electrically conductive, light-reflective metal deposited on the release agent;

introducing between the layer of metal and the inner surface of the faceplate an adherent layer in liquid phase



which is capable of being converted to solid phase by a depression in temperature below its conversion temperature;

uniformly pressing the web against the phosphor layer on the inner surface of the faceplate;

cooling the faceplate below the said liquid-solid conversion temperature of said adherent layer to cause said web to adhere to said phosphor layer;

stripping off the substrate; and

baking the faceplate to drive off at least the binder so as to leave a phosphor screen covered with a layer of the metal.

3,893,878

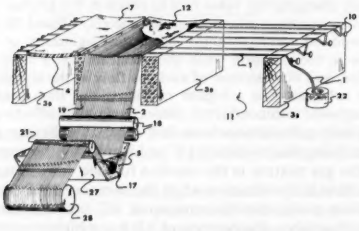
METHOD FOR MAKING A COMPOSITE STRUCTURE

Charles E. Kaempen, Orange, Calif., assignor to Kaempen Industries, Inc., Orange, Calif.

Division of Ser. No. 161,536, July 12, 1971, Pat. No. 3,784,441. This application Sept. 21, 1973, Ser. No. 399,370

Int. Cl. B32b *1/08, 5/12*

U.S. Cl. 156—161 **9 Claims**



1. A method for making a composite structure along a longitudinal axis thereof comprising the steps of

disposing a first ply of continuous first filament strands to extend in the direction of said axis,

freely suspending said first filament strands across a forming gap, defined between a pair of support members disposed at least substantially perpendicular relative to said first filament strands to solely support the same,

gripping the ends of said first filament strands to maintain them in a semi-taut condition,

applying a second ply of continuous and tensioned second filament strands transversely across said first ply to impose a substantially uniform load thereon to tension said first filament strands,

simultaneously deflecting said first and second plies into a concave parabolic configuration in said forming gap defined in accordance with the formula $p = G^2/8H$ wherein p equals the distance between the focus and directrix of said parabolic configuration, G equals the width of said gap and H equals the maximum depth of said gap,

impregnating all of said first and second filament strands with a liquified adhesive means, and

at least partially curing and hardening said adhesive means to maintain said first and second plies in said concave parabolic configuration to form a biaxially tensioned laminate therewith.

3,893,879

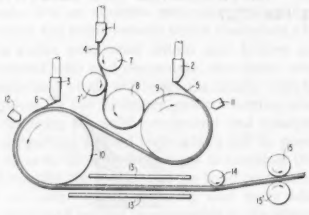
PROCESS FOR PRODUCING A PLASTIC CORRUGATED BOARD AND APPARATUS THEREFOR

Tadashi Ito, and Nobuo Tsuru, both of Tokyo, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Oct. 22, 1971, Ser. No. 191,867

Int. Cl. B29f *3/00;* **B31f** *1/20*

U.S. Cl. 156—164 **10 Claims**



1. A process for producing a corrugated board of a thermoplastic resin which comprises:

1. extruding said thermoplastic resin to form a first flat sheet;

2. passing said first flat sheet through a gap formed between a pair of corrugating rolls having corrugated surfaces to form a corrugated core sheet having corrugations extending parallel to the direction of passage of said core sheet between said corrugating rolls;

3. maintaining one of said corrugating rolls carrying said corrugated core sheet at a peripheral speed from 1 to 20 percent higher than that of the other of said corrugating rolls to provide tension to said corrugated core sheet;

4. extruding a second flat sheet of thermoplastic resin;

5. laying said second flat sheet on said corrugated core sheet from above while said corrugated core sheet is retained on said corrugating roll having the higher peripheral speed;

6. press-adhering said second flat sheet to said corrugated core sheet to form a single-face corrugated board while said second flat sheet is at a sufficiently high temperature to maintain it in the plastic state and said corrugated core sheet is at a sufficiently high temperature to effect adhering, said press-adhering being completed by the weight of said second flat sheet and the tension therein in addition to the pressure of cool air blown onto said second flat sheet; and

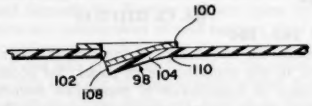
7. cooling both sides of said single-face corrugated board separately and under tension thereby correcting curving and improving the flatness thereof.

3,893,880

METHOD OF MANUFACTURING APPARATUS ACTUATING PHOTOGRAPHIC FILM

Gerald H. Cook, Lynnfield, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 262,044, June 12, 1972, Pat. No. 3,812,515. This application Oct. 4, 1973, Ser. No. 403,520
Int. Cl. B32b *31/18, 31/20*
U.S. Cl. 156—211 **3 Claims**



1. A method of manufacturing a photographic film strip having a protuberance extending from a given side thereof, said protuberance being configured for actuating an operational element of a photographic system during advancement of the film strip therein, said method comprising the steps of: positioning a segment of material over a selected portion of said film strip wherein said protuberance is to be located, said segment having an area exceeding the perimeter of said protuberance and adapted for bonding to said film strip;

forming a short transverse cut through both said segment and said film strip, said cut having a length shorter than the width of said segment and said film strip; and

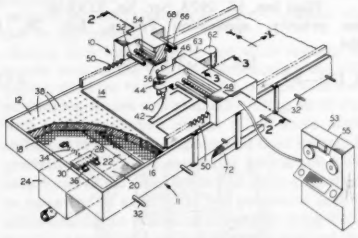
pressing said segment to bond it with said strip while simultaneously forming a depression bordering on said cut in both said segment and said film strip to thereby form said protuberance.

3,893,881

METHOD FOR PRODUCING SEAMED ARTICLES FROM SHEET MATERIAL

Heinz Joseph Gerber, and David Raymond Pearl, both of West Hartford, Conn., assignors to Gerber Garment Technology, Inc., East Hartford, Conn.

Division of Ser. No. 217,921, Jan. 14, 1972, Pat. No. 3,785,898. This application Oct. 15, 1973, Ser. No. 406,694
Int. Cl. B32b *31/00;* **B29c** *19/02*
U.S. Cl. 156—250 **12 Claims**



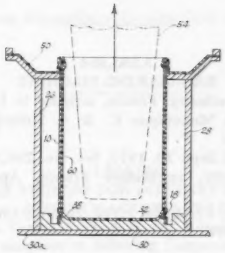
1. The method of producing a seamed article from sheet material, which method comprises the steps of: spreading two sheets of sheet material on top of one another over a stationary supporting surface, bonding said two sheets to one another by means of a bonding agent different from the material of said two sheets along at least one desired seam line forming a part of said article, said bonding step including providing a bonding member movable in two dimensions relative to said supporting surface and moving said bonding member along said desired line while said two sheets are held stationary relative to said supporting surface, and cutting said article from said two sheets of sheet material before said two sheets of sheet material are removed from said supporting surface and while they are held stationary relative to said supporting surface, said cutting step including providing a cutter movable in two dimensions relative to said supporting surface and moving said cutter along a desired line of cut, said bonding step and said cutting step being performed independently of one another during different periods of time.

3,893,882

METHOD FOR LINING DRUMS WITH PLASTIC MATERIAL

William Repenning, Haddonfield, N.J., assignor to Natico, Inc., Chicago, Ill.

Filed Mar. 19, 1973, Ser. No. 342,696
Int. Cl. B29c *17/04, 25/00;* **B29d** *3/02*
U.S. Cl. 156—287 **14 Claims**



1. In the method for producing a plastic lined drum using the drum shell as a mold element, the steps of positioning a drum shell, open at the top and at the bottom, in a frame member which engages the outer wall of the shell all around substantially in sealing relationship a short distance below the open upper end of the shell and sealing off the open bottom end of the shell as a bottom wall, heating to the stretchable stage a film of thermoplastic material dimensioned to extend across the open end at the top of the shell and a short distance therebeyond, effecting a sealing engagement between a portion of the film extending beyond the open end of the shell and the portion of the frame member in sealing engagement with the outer wall of the shell below the upper edge, displacing a mold member vertically downwardly into the interior of the drum towards the open end at the bottom of the shell for a distance less than the length of the shell to displace the strip by expansion into the interior of the shell, drawing a vacuum in the space between the interior of the shell and the expanded film and between the frame member and the portion of the film extending beyond the open upper end to stretch the film by vacuum forming into intimate engagement with the interior walls of the shell and the bottom wall, and about the upper edge of the shell and the adjacent outer wall of the shell to the portion engaged by the frame member and downwardly beyond the open end at the bottom of the shell for a distance corresponding to the shrinkage calculated to take place during cool-down of the stretched film and then removing the entire shell continuously lined with the plastic material throughout the interior and about the upper edge portion from the frame, and positioning the bottom wall of the drum adjacent the open end at the bottom and forming the lower chime about the edge of the bottom wall to join the bottom wall to the drum with the bottom of the thermoplastic liner, having undergone said shrinkage, resting thereon.

3,893,883

HEAT BONDABLE SHEET MATERIALS

Takashi Higuchi, Hikone, and Katsuyoshi Yamauchi, Moriyama, both of Japan, assignors to Firma Carl Freudenberg, Weinheim an der Bergstrasse, Germany

Filed Feb. 16, 1973, Ser. No. 333,255

Claims priority, application Germany, Feb. 25, 1972, 2208976

Int. Cl. C09j *7/00*

U.S. Cl. 156—334 1 Claim

1. The process for making a textile-bonded-to-textile product comprising applying to a surface of a textile fabric support about 5 to 100 g/m² of an adhesive composition consisting essentially of 100 parts by weight of polyethylene having a melt index of about 0.2 to 50 and a molecular weight of at least about 22,000, per about 5 to 45 parts by weight of a terpene resin having a softening point of about 60° to 120°C, placing the surface of said support carrying said adhesive composition on a textile fabric, and ironing said support for at least about 5 seconds at a temperature of about 120° to 160°C and a pressure of about 0.15 to 0.35 Kg/m² whereby bonding is effected.

3,893,884

BAG-MAKING MACHINE

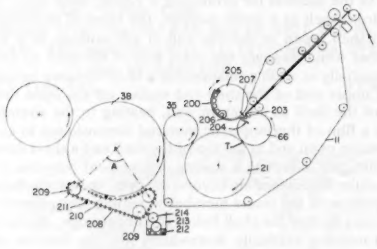
Jean Class, Strasbourg, France, assignor to Les Ateliers de Constructions Mecaniques C. & A. Holweg S.A., Strasbourg, France

Filed Sept. 20, 1972, Ser. No. 290,750

Claims priority, application France, Apr. 26, 1972, 72.15771

Int. Cl.² B31B *21/14, 21/26, 21/60*

U.S. Cl. 156—498 5 Claims



1. In a machine for the manufacture of bags from thermoplastic material, comprising means for advancing a continuous tube of thermoplastic material, means for severing lengths from said tube, a welding drum on which one end of each said length is heat-sealed closed along a transverse weld line, and a further drum about which said lengths pass after leaving said welding drum; the improvement comprising means disposed between said severing means and said welding drum for folding said lengths about at least one transverse fold line, and an endless belt that coacts with said further drum so that said lengths pass between said belt and said further drum, said belt having thereon a plurality of spaced bars that contact the heat-sealed ends of said lengths along said transverse weld line, and means to cool said bars.

3,893,885

AUXILIARIES FOR THE MANUFACTURE OF PAPER

Heinz Ziemann, Leichlingen; Gerhard Troemel, Peach near Cologne, and Wolfgang Lehmann, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Continuation of Ser. No. 840,051, July 8, 1969, abandoned. This application Nov. 23, 1973, Ser. No. 418,205

Claims priority, application Germany, July 16, 1968, 1771814

Int. Cl. D21l *3/58*

U.S. Cl. 162—164 5 Claims

1. Process for increasing the retention of fibers, fillers and pigments in the manufacture of paper, for accelerating the dehydration of suspensions of paper raw material, and for processing waste waters from paper machines by filtration, sedimentation and flotation, by the addition of basic polyamides to the suspensions of paper raw material and/or to the waste waters from paper machines, which comprises adding as basic polyamides, high-molecular water-soluble reaction products which have been obtained by the reaction of compounds which are polyfunctional with regard to amino groups, with basic polyamides which are dissolved or dispersed in water and are prepared by the reaction of polyvalent amines containing at least two amino groups capable of forming amides and at least one further primary, secondary or tertiary amino group, with saturated aliphatic dicarboxylic acids containing 4 to 10 carbon atoms and with ω-amino-carboxylic acids containing 5 to 8 carbon atoms, or their lactams, and for the preparation of said reaction products there are used less than 1 gram-equivalent of reactive groups in the polyfunctional compounds for every gram-equivalent of basic amino groups in the basic polyamides using high molecular water-soluble reaction products for the preparation of which has been used 0.6 – 0.01 gram-equivalent of reactive groups in the polyfunctional compounds for every gram-equivalent of basic amino groups in the basic polyamides and wherein the whiteness of the paper is not adversely affected by the increased retentive effects.

3,893,886

REMOVABLE DIAGRID FOR SUPPORTING THE FUEL ASSEMBLIES OF A NUCLEAR REACTOR

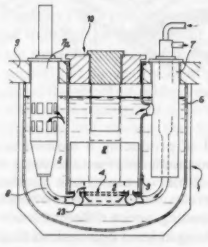
Michel Aubert, Pierrevert; Michel Bellier, Saint-Germain-en-Laye, and Jean-Marie Berniolles, Pierrevert, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 15, 1973, Ser. No. 323,636

Claims priority, application France, Jan. 20, 1972, 72.01864

Int. Cl. G21c *15/00*

U.S. Cl. 176—87 4 Claims



1. A removable diagrid for a nuclear reactor having fuel assemblies supported by the diagrid, a lateral cylindrical shell for a reactor tank and a reactor core, said diagrid being made up of a single-unit assembly which is laid by means of a horizontal peripheral bearing surface on an internal shoulder formed in said lateral cylindrical shell of said reactor tank

having a vertical axis which surrounds the diagrid and said reactor core, said single-unit assembly being made up of two parallel and horizontal support plates which are braced with respect to each other by vertical hollow columns in which the lower ends of the fuel assemblies to be supported are engaged in coaxial relation therewith, wherein the horizontal support plates are rigidly fixed at their periphery to an annular box element for the distribution of a coolant fluid at high pressure which is conveyed to the diagrid by means of a toric manifold, said manifold being connected to the annular box element and rigidly fixed beneath the bottom support plate by locking means which are independent of said support plate and said annular box element, vertical ducts being so arranged as to open at one end into the manifold and at the other end into the annular box element, the upper ends of said ducts being passed through apertures which are formed in the opposite bottom wall of said annular box element and which are surrounded by coaxial collars welded to said ducts at the end faces thereof.

3,893,887

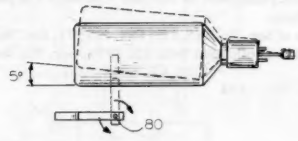
METHOD FOR RAPID HARVESTING OF ROLLER CULTURE SUPERNATANT FLUID

Ralph E. Smith, and Frank E. Kozoman, both of Durham, N.C., assignors to Duke University, Inc., Durham, N.C.

Division of Ser. No. 377,806, July 9, 1973, Pat. No. 3,847,749. This application May 30, 1974, Ser. No. 474,369

Int. Cl.[2] C12B *1/00*; C12K *9/00*

U.S. Cl. 195—1.7 **5 Claims**



1. The method of operating a roller tissue culture apparatus of the type having a plurality of parallel drive and idler rollers on which a plurality of roller culture bottles are rotated during cell growth and which permits supernatant fluids to be removed from the bottles and fresh nutrient fluid added on an intermittent basis, comprising the steps, under automatic programmed control of:

a. periodically interrupting the normal rotation of the bottles on the rollers;

b. during such interruptions and while leaving all of the mouth ends of the bottles positioned on the rollers, engaging all of the rear ends of the bottles with mechanical positioning means and gradually tilting all of the bottles with such positioning means to an acute angle of tilt sufficient to allow the supernatant fluid in each bottle to gradually flow to the respective lowest point within the mouth end of the tilted bottle and there collect proximate an open end of an effluent line proximate such point;

c. while holding the bottles so tilted, removing the supernatant fluid essentially completely from each of the bottles through such effluent lines by pumping;

d. gradually lowering all of the bottles with said positioning means until they assume the same respective positions on said rollers as were occupied prior to being tilted;

e. disengaging said positioning means from contact with said bottle rear ends;

f. at a selected time after the supernatant fluid has been removed from the bottles and prior to resuming their normal rotation on the rollers feeding a new supply of nutrient fluid into the bottles through an influent line; and

g. resuming the normal rotation of the bottles until the bottle rotation is again interrupted for the purpose of repeating the cycle.

3,893,888

FERMENTATIVE PRODUCTION OF L-VALINE

Takayasu Tsuchida, Kawasaki, and Fumihiro Yoshinaga, Fujisawa, both of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Mar. 1, 1974, Ser. No. 447,379

Claims priority, application Japan, Mar. 9, 1973, 48-27738

Int. Cl. C12d *13/06*

U.S. Cl. 195—29 **5 Claims**

1. A method of producing L-valine by fermentation which comprises:

a. culturing a microorganism of the genera Brevibacterium or Corynebacterium on a nutrient medium under aerobic conditions,

1. said microorganism being capable of producing extracellular L-valine in said medium,

2. said medium containing sources of assimilable carbon and nitrogen and minor organic and inorganic nutrients necessary to the growth of said microorganism,

3. said microorganism being cultured on said nutrient medium until L-valine accumulates in said medium,

4. said microorganism being resistant to 2-thiazolalanine, and

b. recovering accumulated L-valine from said medium.

3,893,889

CULTURE MEDIUM FOR DIFFERENTIATION OF ENTEROBACTERIACEAE

Bert Warren, Tuxedo Park, N.Y., and Ronald K. Miller, Fort Lee, N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Feb. 25, 1974, Ser. No. 445,507

Int. Cl. C12k *1/10*

U.S. Cl. 195—100 **10 Claims**

1. An agarose-based culture medium for differentiation and identification of bacteria of the family Enterobacteriaceae which comprises a citrate substrate, and as a sole additional carbohydrate substrate, a member selected from the group consisting of inositol, raffinose and rhamnose and a compatable pH responsive dye system, whereby the color change produced by the reaction of Enterobacteriaceae bacteria with said carbohydrate substrate on said dye system does not interfere with the color change produced by the reaction of said bacteria with said citrate.

3,893,890

PROCESS FOR INHIBITING THE ACTION OF PEPSIN

Otto B. Wurzburg, Whitehouse Station; Chester D. Szymanski, Martinsville, and Leo Kurger, Kendall Park, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Oct. 23, 1973, Ser. No. 408,317

Int. Cl. A61k *19/00*; C12b *1/00*

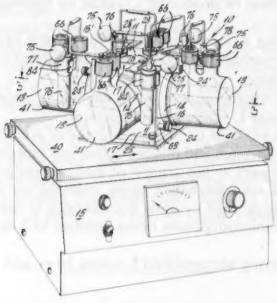
U.S. Cl. 195—104 **9 Claims**

1. A process for inhibiting the action of pepsin comprising exposing pepsin, in an aqueous solution at a pH less than 5.0 to the action of a water-soluble polymer selected from the group consisting of sulfonated homo- and copolymers of styrene and salts thereof; said sulfonated polymer having a degree of substitution of from about 0.7 to about 1.3 sulfonate groups per unit of styrene and an average molecular weight greater than 600.

3,893,891
MULTIPLE DIFFUSION CHAMBER

Myron Tannenbaum, East Brunswick, N.J., and Joseph M. Kornfeld, Coventry, Conn., assignors to New Brunswick Scientific Co., Inc., New Brunswick, N.J.

Filed June 14, 1973, Ser. No. 370,083
Int. Cl.[2] C12B *1/00*
U.S. Cl. 195—127 **11 Claims**

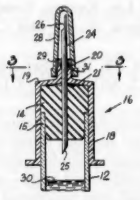


1. A multiple diffusion chamber for mixed culture interactions under controlled conditions comprising a fluid tight housing defining a central diffusion reservoir for carrying a liquid culture nutrient medium, a plurality of discrete radially extending fluid tight organism growth chambers for carrying organism cultures in said liquid culture nutrient medium, said organism growth chambers communicating with said central diffusion reservoir, each organism growth chamber being radially spaced on the periphery of said central diffusion reservoir housing and connected thereto, each organism growth chamber including means for selectively controlling communication between organism growth chambers and said central diffusion reservoir for thereby permitting continuous dialysis of said culture nutrient medium and metabolic products suspended therein into and out of each of said organism growth chambers and preventing egress of an organism culture therefrom, and means for shaking said multiple diffusion chamber for thereby affecting communication between said central diffusion reservoir and each of said organism growth chambers.

3,893,892
VENTING ASSEMBLY FOR THE CULTIVATION OF MICROORGANISMS FROM BODY FLUID

Jack Judson Mehl, Landing, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Division of Ser. No. 342,086, March 16, 1973, and a continuation-in-part of Ser. No. 215,730, Jan. 6, 1972, abandoned. This application Feb. 11, 1974, Ser. No. 440,966
Int. Cl. C12b *1/00*
U.S. Cl. 195—127 **4 Claims**



1. A venting assembly adapted to be removably mounted on a container having an open end and a resilient closure thereon and having a culture medium disposed therein for the collection, cultivation and identification of microorganisms contained in a specimen of body fluid, said assembly comprising:

a tubular body portion having a closed end and an open end;

a hub formed on said closed end and having an axial bore formed therethrough;

a cannula rigidly mounted in the axial bore between the ends of said bore;

said cannula having a pointed end positioned within the tubular body and being capable of piercing the resilient closure means mounted in the open end of said container when said assembly is mounted on said container;

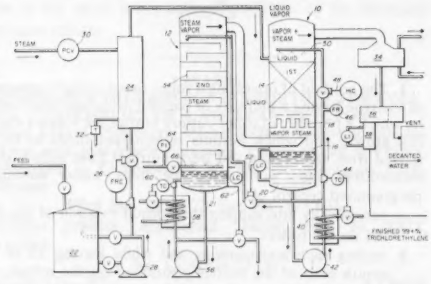
a shield enclosing said other end of said cannula and being removably mounted on said hub;

said shield being constructed with a plurality of ribs disposed around the inner surface thereof so that the shield mounted on the hub forms a plurality of passageways between said shield and said hub, said ribs being of a dimension to provide passageways which prevent the passage of microorganisms therethrough, whereby when said assembly is mounted on said container, the plurality of passageways provide for the circulation of microbial gases from the interior of said container to the atmosphere and for diffusion of atmospheric oxygen from the outside to the inside of the container but prevent the passage of microorganisms therethrough.

3,893,893
APPARATUS FOR THE RECOVERY OF TRICHLORETHYLENE FROM OIL WASTE

John G. Miserlis, Lowell, and Arthur Petrou, Haverhill, both of Mass., assignors to Silresim Chemical Corporation, Lowell, Mass.

Division of Ser. No. 185,529, Oct. 1, 1971, Pat. No. 3,803,005. This application Feb. 22, 1974, Ser. No. 444,863
Int. Cl. E01d *3/00*
U.S. Cl. 202—154 **4 Claims**



1. An apparatus for the recovery of a halocarbon-oil mixture which comprises:

a. a first distillation column having an upper vapor section and a lower liquid section;

b. means to introduce the mixture as a liquid portion and a vapor portion into the upper vapor section of the first distillation column, the liquid flowing to the lower liquid section of said column;

c. a second distillation column downstream of the first distillation column and in communication therewith, the second distillation column having upper and lower sections;

d. means to introduce a portion of the liquid in the lower liquid section of the first distillation column into the upper section of the second distillation column;

e. means to introduce a carrier fluid immiscible with the halocarbon into the lower section of the second distillation column to volatilize the halocarbon contained in the liquid mixture introduced into the second distillation column from the first distillation column, thereby volatilizing at least a portion of the halocarbon, the volatilized halocarbon and the carrier fluid forming a vapor stream;

f. means to recover from the second distillation column the liquid portion from the lower section of the second distillation column;

g. means to introduce the vapor stream from the second distillation column into the lower liquid section of the first distillation column, the vapor stream immiscible with the halocarbon to lower the partial pressure of the halocarbon in the first distillation column;

h. means to recycle directly from the lower liquid section of the first distillation column a portion of the liquid in the lower liquid section to the upper vapor section above the point of introduction of the mixture, to exchange thermal energy with and control the temperature of the mixture introduced into the upper section of the first distillation column, and to form a vaporous portion; and

i. means to recover the vaporous portion from the upper section of the first distillation column.

3,893,894

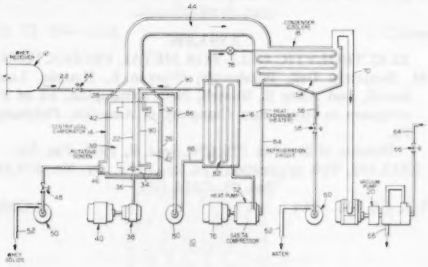
LOW TEMPERATURE WATER PURIFICATION SYSTEM

Gerald F. Humiston, South Barre, Vt., assignor to Pollution Control, Inc., South Barre, Vt.

Filed June 13, 1973, Ser. No. 369,515

Int. Cl. B01d *3/00, 3/10, 1/22*

U.S. Cl. 202—235 **5 Claims**



1. A low temperature purification system operable for purposes of separating from a solution the solids and dissolved substances contained therein comprising:

a. a source of supply of a solution containing solids and dissolved substances;

b. evaporator means connected to said source of supply for receiving solution therefrom, said evaporator means comprising a centrifugal vacuum evaporator operable to separate solids from the solution by centrifugal acceleration and to separate dissolved substances from the solution by vacuum distillation, said centrifugal vacuum evaporator including a stationary housing providing a chamber, a plurality of vanes mounted within said chamber for rotation therewithin, drive means connected to said plurality of vanes operable for causing the rapid rotation thereof, an inlet for solution containing solids and dissolved substances, an outlet for solids adjacent the base of said chamber and an outlet for vapors adjacent the top of said chamber, said inlet for said evaporator means being connected to said source of supply by a conduit, said chamber, conduit and source of supply comprising the solution intake portion of the purification system;

c. vacuum means operable for producing a vacuum;

d. condenser means operatively connected between said vapor outlet of said evaporator means and said vacuum means, said condenser means being operable at reduced pressure during operation of said vacuum means and said condenser means in turn producing a reduced pressure within said evaporator means to cause at least a portion of the solution in said evaporator means to vaporize to produce vapors therefrom for transmission to said condenser means, said condenser means including a coil supported therewithin in the path of flow of the vapors received from said evaporator means, said coil being connected into a heat pump closed loop flow path so as to receive a heat transfer refrigerant fluid at a temperature below the condensation temperature of the vapors in said condenser to cause the vapors coming into contact with said coil to condense and thereby produce condensate with the heat produced during condensation being absorbed by the fluid flowing through said coil;

e. outlet means connected to said condenser means for discharging the condensate therefrom; and

f. a refrigerant fluid compressor means and an additional coil connected in series in said heat pump loop, said additional coil comprising part of an indirect heat transfer means operatively connected in another closed loop with said evaporator means to transfer the heat of condensation from said condenser means through said additional coil to solution being introduced into said evaporator means, said heat transfer means including pumping and conduit means for transporting at least a portion of the solution containing solids and dissolved substances from a point of supply in said solution intake portion and into heat exchange with the heat transfer fluid to transfer heat of condensation to that portion of the solution and effect an increase in the temperature thereof, said pumping means and conduit then transporting the heated solution to said vacuum centrifugal evaporator to prevent reduction of the temperature of the body of the solution within said evaporator as evaporation takes place, said heat transfer means including mechanical means providing additional heat energy in the solution being introduced to said vacuum evaporator to provide a preselected minimum temperature in the body of the solution within said centrifugal vacuum evaporator during evaporation and to compensate for heat losses within the system

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3,893,895

DISTILLATION OF 1,2-UNSATURATED CARBOXYLIC ACIDS IN SOLUTION WITH SELECTED AMINES

Jurgen Dehnert, Bruhl; Axel Kleemann; Theodor Lussling, both of Grossauheim; Ewald Noll, Grosskrotzenburg; Hans Schaefer, and Gerd Schreyer, both of Grossauheim, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Filed July 19, 1973, Ser. No. 380,664

Claims priority, application Germany, July 19, 1972, 2235326

Int. Cl.[2] B01D *3/34*

U.S. Cl. 203—59 **15 Claims**

1. A process for the purification of 1,2-unsaturated carboxylic acids containing carbonyl compounds comprising treating the impure carboxylic acid with an amine which is selected from the group consisting of hydroxylamine, a monoalkyl amine, naphthylamine and 1,2-dianilinoethane to chemically bind said carbonyl compounds and then recovering said carboxylic acid by distillation.

3,893,896

GOLD PLATING BATH AND PROCESS

Alexander Korbelak, Southbury, and John King, Trumbull, both of Conn., assignors to Handy & Harman, New York, N.Y.

Filed July 2, 1973, Ser. No. 375,616

Int. Cl. C23b *5/42, 5/46*

U.S. Cl. 204—44 **9 Claims**

1. An acidic electrolytic bath comprising:

a. an alkali gold cyanide in an amount ranging from 0.1 to 50 grams per liter;

b. a weak lewis acid in an amount ranging from 5 to 250 grams per liter and selected from the group consisting of a quinone, boric acid, phthalic acid, potassium acid phthalate and mixtures thereof;

c. a weak polyfunctional water-soluble aliphatic carboxylic acid in an amount ranging from 5 to 500 grams per liter;

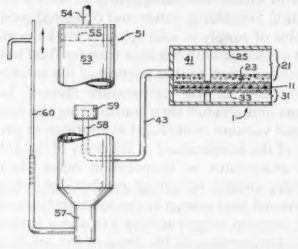
d. a non-depositing metallic compound in an amount ranging from 5 to 250 grams per liter;
e. a metallic hardener in an amount ranging from 0.01 to 15 grams of metal ion per liter; and
f. water.

3,893,897

METHOD OF OPERATING ELECTROLYTIC DIAPHRAGM CELLS HAVING HORIZONTAL ELECTRODES

Carl W. Raetzsch, and Daniel E. Wiley, both of Corpus Christi, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 12, 1974, Ser. No. 460,414
Int. Cl. C01f 7/06
U.S. Cl. 204—98 **15 Claims**



1. A method of operating an electolytic cell which cell has an electrolyte chamber divided horizontally by a permeable barrier into an anolyte chamber containing a substantially horizontal anode above said permeable barrier, and a catholyte chamber containing a substantially horizontal cathode below said horizontal barrier; which method comprises feeding alkali metal chloride brine to said anolyte chamber; passing electrical current through said cell at a current density high enough to generate sufficient hydrogen gas on said cathode to oppose the unaided flow of electrolyte through said permeable barrier from said anolyte chamber to said catholyte chamber; generating chlorine gas on said anode; collecting the chlorine gas in said anolyte chamber above the anolyte therein to maintain a chlorine gas pad in said anolyte chamber; withdrawing the chlorine gas from said anolyte chamber to a liquid-containing tank; discharging the chlorine gas from said cell into the liquid in said liquid-containing tank and maintaining a level of liquid in said liquid-containing tank above the level of anolyte liquor in said cell sufficient to augment the flow of anolyte liquor through said permeable barrier against the pressure of the hydrogen to said catholyte chamber.

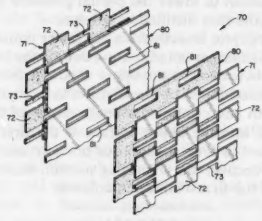
3,893,898

METHOD FOR REMOVING AND/OR SEPARATING PARTICLES FROM FLUID CONTAINING THE SAME

James T. Candor, 5440 Cynthia Ln., Washington Twp., Ohio 45429

Continuation-in-part of Ser. No. 383,255, July 27, 1973, which is a division of Ser. No. 263,605, June 16, 1972, Pat. No. 3,795,605, which is a continuation-in-part of Ser. No. 53,402, July 9, 1970, abandoned, which is a continuation-in-part of Ser. No. 25,938, April 6, 1970, Pat. No. 3,687,834, which is a continuation-in-part of Ser. No. 864,851, Oct. 8, 1969, abandoned, which is a continuation-in-part of Ser. No. 811,421, March 28, 1969, abandoned. This application Aug. 21, 1974, Ser. No. 499,178
Int. Cl. B01k 5/00
U.S. Cl. 204—180 R **10 Claims**

1. A method for separating particles from a fluid carrying the same comprising the steps of directing said fluid through an inlet means of a passage defining means having an outlet means, electrostatically directing at least some of said particles intermediate said inlet means and said outlet means solely by an electrostatic action, creating electroconvection in said fluid intermediate said inlet means and said outlet means, and removing said fluid from said outlet means, said steps of electrostatically directing at least some of said particles and of



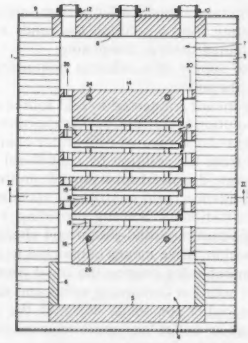
creating electroconvection in said fluid comprising the step of creating a plurality of non-uniform electrostatic fields with each field at least partially extending across said passage means and with the higher intensity portion of each field being substantially oppositely located relative to the higher intensity portion of an adjacent non-uniform field.

3,893,899

ELECTROLYTIC CELL FOR METAL PRODUCTION

M. Benjamin Dell, Pittsburgh; Warren E. Haupin, Lower Burell, and Allen S. Russell, New Kensington, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Division of Ser. No. 178,650, Sept. 8, 1971, Pat. No. 3,822,195. This application Oct. 25, 1973, Ser. No. 409,588
Int. Cl. C22d 3/02
U.S. Cl. 204—244 **9 Claims**



1. A cell for producing metal comprising
an anode, at least one intermediate bipolar electrode and a cathode in superimposed, spaced relationship defining inter-electrode spaces, each bounded by an anode surface and a cathode surface, for electrolyzing bath composed essentially of metal chloride dissolved in molten solvent, a bath supply passage extending downwardly to each inter-electrode space,
a gas lift passage extending upwardly from each inter-electrode space at a location spaced from the bath supply passage for receiving chlorine, bath and metal from the inter-electrode space, said gas lift passage being adapted

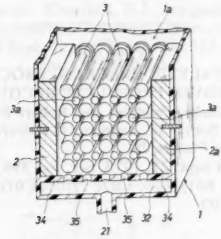
upon electrolysis of bath in each inter-electrode space to cause flow of bath out of the inter-electrode space, and thus induce concurrent outward flow of metal swept therewith, and to pump bath upwardly by employment of the gas lift effect of the chlorine produced and conducted to said passage, and to permit metal flowing into said passage to settle therein,

in which cell the flow of bath down through the supply passage, through the inter-electrode spaces, and back up through the gas lift passage may be maintained by the flow of chlorine produced, while metal produced may settle in a direction counter current to the gas lift.

3,893,900
APPARATUS FOR TREATING WASTEWATER USING AN ELECTROLYTIC CELL

Toru Teshima, Hadano; Toshiie Nagasao; Minoru Tanaka; Kazuo Ariga, all of Tokyo, and Yoshiko Takamura, Kawasaki, all of Japan, assignors to Stanley Denki Kabushiki Kaisha, Tokyo and Kabushiki Kaisha Inoue Japax Kenkyusho, Kanagawa-ken, both of, Japan

Filed May 21, 1973, Ser. No. 362,511
Claims priority, application Japan, May 24, 1972, 47-51403; June 9, 1972, 47-57389; June 30, 1972, 47-76565
Int. Cl. B01k *3/00*
U.S. Cl. 204—268 **2 Claims**



1. Apparatus for treating wastewater comprising an electrolytic cell

a pair of main electrodes opposed in the electrolytic cell to each other,

a power source connected to the main electrodes,

a plurality of auxiliary electrodes disposed between the main electrodes, the auxiliary electrodes being bar electrodes of conductive material arranged at such spaces as to avoid short circuits thereamong and so as to form a plurality of rows and a plurality of columns, thereby effectively increasing the contact surface areas of the auxiliary electrodes and the wastewater,

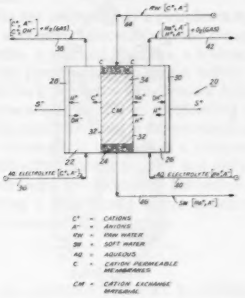
said electrolytic cell having a perforated partition spaced from the bottom of the cell and defining therewith a storage cell, said storage cell having a wastewater inlet whereby wastewater is introduced into the electrolytic cell through the storage cell and the perforations in the partition, and

a plurality of insulating bars disposed in the spaces, respectively, parallel with and repetitively staggered relative to said auxiliary electrodes and isolated therefrom whereby to cause pulsating currents of the wastewater in the electrolytic cell.

3,893,901
SYSTEM FOR SOFTENING AND DEALKALIZING WATER BY ELECTRODIALYSIS

Alvaro R. Tejeda, New York, N.Y., assignor to J. Vast Associates, Inc., New York, N.Y.

Filed Dec. 4, 1973, Ser. No. 421,510
Int. Cl. B01d *13/02*
U.S. Cl. 204—301 **15 Claims**



1. An electrodialytic apparatus for softening hard raw water, said apparatus comprising at least five serially disposed compartments including a first compartment having a ferrous cathode electrode disposed therein, a second compartment immediately adjacent said first compartment and separated therefrom by a cation permselective membrane, a third compartment immediately adjacent said second compartment and separated therefrom by an anion permselective membrane, a fourth compartment immediately adjacent said third compartment and separated therefrom by a cation permselective membrane, a body of cation exchange material disposed within said fourth compartment, a fifth compartment immediately adjacent said fourth compartment and separated therefrom by a cation permselective membrane, a ferrous anode electrode disposed in said fifth compartment, means for introducing hard raw water into the fourth compartment, means for introducing into and removing from the second compartment an aqueous solution of sodium chloride, means for introducing into and removing from the third compartment electorlyte fluid, means for introducing into and removing from the first and fifth compartments an aqueous caustic solution, means for impressing a direct electric current across said cathode and anode electrodes, and means for removing softened water from the fourth compartment.

3,893,902
ELECTROLYTIC SEA WATER PROCESS

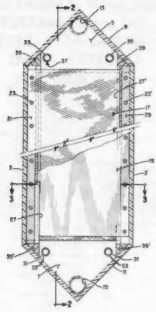
Richard E. Loftfield, Chardon; John E. Bennett, and John E. Cinke, both of Painesville, all of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Apr. 12, 1973, Ser. No. 350,598
Int. Cl. B01k *1/00*
U.S. Cl. 204—95 **4 Claims**

1. In the method of operating a cell for the electrolysis of sea water to produce hypochlorite, which cell comprises an enclosure containing a plurality of vertically disposed electrodes in an alternate array of anodes and cathodes, the improvement which comprises reducing the formation of undesirable deposits on the electrodes by:

A. introducing sea water to the cell at a point below the electrodes through a series of orifices, substantially corresponding in number and location to at least the cathodes, the direction of the orifices being such that the sea water

first impinges primarily on nonelectrode surfaces immediately subjacent the electrodes, and the sea water velocity through the orifices being between 5 and 25 feet per second; and



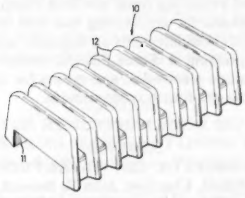
B. maintaining a sea water velocity through the cell during electrolysis sufficient to at least suspend substantially all particulate matter present.

3,893,903

CATHODIC PROTECTION OF VEHICLES, ESPECIALLY MOTOR CARS

Jan Lindholm, Malmvagen 12 C., Sollentuna, Sweden

Filed Feb. 22, 1973, Ser. No. 334,906
Int. Cl. C23f *13/00*
U.S. Cl. 204—197 **1 Claim**



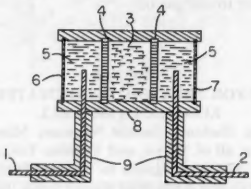
1. A device for protecting from corrosion a surface of a steel structure of a road vehicle, said device comprising a galvanic anode having a flat inner side and an outer side means carried by said inner side for attaching the anode to a surface section exposed to road dirt, said means including a permanent magnet connected to said anode, means for electrically connecting said anode with said structure, and means carried by said outer side for collecting road dirt, the last-mentioned means comprising spaced outwardly projecting parallel flange-like elongations extending on the outer side for collecting layers of dirt of greater thickness than those which would be deposited upon the unprotected surface of the steel structure.

3,893,904

ELECTROOSMOTIC PRESSURE CELL

Albert F. Hadermann, Rt. 1, Ijamsville, Md. 21754; Paul F. Waters, 3318 45th St., Northwest, Washington, D.C. 20016, and Jung Woo Woo, 2008 N. Adams, Arlington, Va. 22201

Filed July 2, 1973, Ser. No. 375,515
Int. Cl. B01d *13/02*
U.S. Cl. 204—301 **5 Claims**



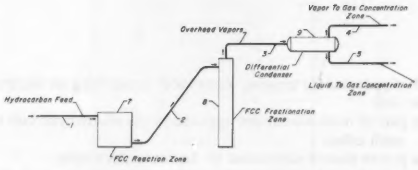
1. An electroosmotic cell, capable of use at voltages in the kilivolt range and capable of generating very high pressures, comprising a housing having flexible diaphragms on opposite sides thereof, two porous frit walls dividing the cell into three chambers, said wall of a coarse, porous insulating frit; a nonaqueous polar liquid containing a field-dissociable weak electrolyte, and a pair of platinum electrodes in the electrode compartments.

3,893,905

FLUID CATALYTIC CRACKING PROCESS WITH IMPROVED PROPYLENE RECOVERY

Ellsworth R. Fenske, Palatine, and Robert F. Anderson, La Grange Park, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Sept. 21, 1973, Ser. No. 399,561
Int. Cl. B01j *9/20*; C07c *11/06*; C01b *33/28*
U.S. Cl. 208—103 **3 Claims**



1. In a fluid catalytic cracking process wherein (i) a hydrocarbon feed contacts cracking catalyst at cracking conditions in a reaction zone, (ii) reaction products are withdrawn from the reaction zone and introduced into a fractionation zone, (iii) overhead vapors from the fractionation zone are passed to a condenser, and (iv) effluent from the condenser passes in separate conduits to gas concentration facilities, the improvement which comprises: condensing said overhead vapors in a differential condenser and in said differential condenser separating the overhead vapor into a gaseous phase containing propylene and a liquid phase comprising hydrocarbon molecules having 4 or more carbon atoms, said separation being effected by withdrawing liquid phase upon condensation to form gaseous and liquid phases containing a non-equilibrium distribution of propylene.

3,893,906

PRODUCTION OF LOW POUR POINT GAS OIL AND HIGH OCTANE NUMBER GASOLINE

William Everett Garwood, Haddonfield, N.J., and John J. Wise, Media, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 391,380, Aug. 24, 1973. This application Mar. 21, 1974, Ser. No. 453,246
Int. Cl.[2] C10G *13/02*; C07C *3/52*
U.S. Cl. 208—111 11 Claims

1. A process of upgrading petroleum fractions which comprises contacting an admixture, containing at least 10% benzene, of gasoline boiling range fraction having a boiling range of at least about C_6 to 239°F which contains at least about 20 weight percent aromatics and a gas oil fraction having an end point up to about 850°F and a pour point of at least about +20°F with a catalyst comprising a zeolite consisting essentially of a synthetic crystalline aluminosilicate zeolite derived in an organic cation containing form, having a silica to alumina ratio of at least about 12 to 1 and having a hydrogenation/dehydrogenation component; converting said admixture in the presence of hydrogen at a space velocity of about 0.5 to 20 WHSV, at a temperature of about 500° to 1,000°F and at a hydrogen to hydrocarbon ratio of about 1 to 20 to 1 to a product comprising a gas oil fraction having a lower pour point, a gasoline fraction having a higher octane and a light gas fraction; and resolving said product into said gas oil fraction, said gasoline fraction and said light gas fraction.

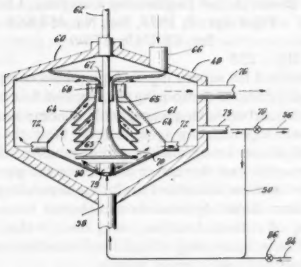
Tar Sands

3,893,907

METHOD AND APPARATUS FOR THE TREATMENT OF TAR SAND FROTH

Gerard P. Canevari, Cranford, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Sept. 10, 1973, Ser. No. 395,930
Int. Cl. C10g *1/04*
U.S. Cl. 208—11 10 Claims



1. A method of separating bitumen from bitumen-coated particles comprising the steps of:
forming a froth of the bitumen-coated particles by contacting and agitating the coated particles with a hot liquid;
separating the particles of the froth from the bitumen by centrifuging the froth in a disc recycling apparatus which provides a relatively light overflow effluent and a relatively heavier underflow effluent and wherein the underflow effluent of the centrifuge is fed back to an input of the centrifuge through a return flow path; and,
combining a liquid wetting transfer agent with the underflow effluent in the return flow path.

3,893,908

REFORMING WITH CATALYSTS CONTAINING A GROUP VI A METAL COMPONENT AND TECHNETIUM AS A PROMOTER

Albert L. Hensley, Jr., Munster, and Thomas D. Nevitt, Valparaiso, both of Ind., assignors to Standard Oil Company, Chicago, Ill.

Division of Ser. No. 285,302, Aug. 31, 1972, which is a continuation of Ser. No. 127,808, March 24, 1971, abandoned. This application Mar. 15, 1974, Ser. No. 451,357
Int. Cl. C10g *35/06*
U.S. Cl. 208—136 12 Claims

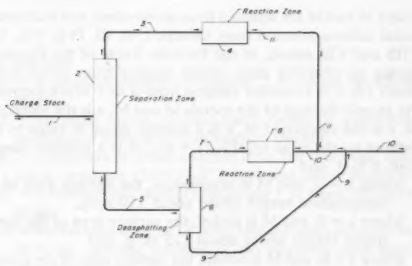
1. A process for the reforming of a petroleum hydrocarbon stream which is a member selected from the group consisting of a virgin Naphtha, a cracked Naphtha, a hydrocarbon fraction boiling in the gasoline boiling range, mildly - reformed Naphthas and mixture thereof, which process comprises contacting said hydrocarbon stream in a reforming zone under suitable reforming conditions and in the presence of hydrogen with a catalytic composition comprising a component having hydrogenation-dehydrogenation activity and dehydrocyclization activity comprising the oxides of chromium, a suitable support comprising a catalytically active alumina, and as a promoter a small amount of technetium.

3,893,909

FUEL OIL PRODUCTION BY BLENDING HYDRODESULFURIZED VACUUM GAS OIL AND HYDRODESULFURIZED DEASPHALTED RESIDUUM

Charles W. Selvidge, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 212,477, Dec. 27, 1971, abandoned. This application Oct. 26, 1973, Ser. No. 409,988
Int. Cl. C10g *23/02*
U.S. Cl. 208—211 4 Claims



1. A process for producing fuel oil containing less than about 1.0% by weight of sulfur, from an asphaltic hydrocarbonaceous charge stock containing more than about 150 ppm. of metals, which process comprises the steps of:
a. separating said charge stock in a vacuum distillation zone to provide a vacuum gas oil fraction substantially free from asphaltics and a vacuum residuum asphaltenic fraction;
b. reacting said vacuum gas oil fraction and hydrogen in a first catalytic reaction zone containing a hydrodesulfurization catalyst, at desulfurization conditions selected to convert sulfurous compounds into hydrogen sulfide and hydrocarbons, including a catalyst bed temperature in the range of about 600°F. to about 880°F. and a pressure from about 500 to about 1,500 psig.;
c. deasphalting at least a portion of said vaccum residduum fraction with a deasphalting solvent in a solvent extraction zone to provide a solvent-rich liquid oil phase containing from about 30 to about 100 ppm. by weight of metals and a solvent-lean asphaltene concentrate;
d. reacting at least a portion of said liquid oil phase from step (c) with hydrogen in a second catalytic reaction zone, at desulfurization conditions selected to convert

sulfurous compounds into hydrogen sulfide and hydrocarbons, including a pressure from about 500 to about 1,500 psig. and a catalyst bed temperature in the range of about 620°F. to about 900°F., and at least about 20°F. higher than the temperature in said first reaction zone, said catalyst in said second catalytic reaction zone comprising a Group VI-B and a Group VIII metal on alumina, said catalyst having a pore volume greater than 0.5 cc./gm.; and,

e. recovering a fuel oil product, containing less than about 1.0% by weight of sulfur by blending the desulfurized gas oil with the desulfurized liquid oil from step (d).

3,893,910

PROCESS FOR REFORMING NAPHTHAS WITH NOVEL CHYRSOTILE CATALYST COMPOSITIONS

Harry E. Robson, Baton Rouge, La.

Division of Ser. No. 233,368, March 9, 1972, Pat. No. 3,804,741, which is a division of Ser. No. 68,324, Aug. 31, 1970, Pat. No. 3,729,429. This application Aug. 24, 1973, Ser. No. 391,352

Int. Cl. C10g *35/06*

U.S. Cl. 208—138 **33 Claims**

1. A process for improving the octane quality of naphthas comprising contacting the said naptha at reforming conditions including temperatures ranging from about 400°C to about 550°C and pressures ranging from about 150 psi to about 550 psi with a catalyst composite including a chrysotile component and a metal hydrogenation component, said chrysotile component comprising a layered complex metal silicate composition characterized as having repeating units defined by the following structural formula:

$$(1-x)M^{(a)} + xM^{(b)}_{n} \quad (OH)_4Si_2O_5 \cdot wH_2O$$

where M and M are selected from monovalent and multivalent metal cations selected from Groups I, II, III, IVB, VB, VIB, VIIB and VIII metals, of the Periodic Table of the Elements, having an effective ionic radius ranging from about 0.5 to about 1A, x is a number ranging from 0 to 1 which expresses the atomic fraction of the metals M and M, a is the valence of M, b is the valence of M, n is a number equal in value to that defined by the ratio $6/[a(1-x) + bx]$, w is a number ranging from 0 to 4, and

where $x = 0$, and M is magnesium, the surface area of the composition ranges above about 110 m^2/g,

where $x = 0$, and M is nickel, the surface area of the compsotion ranges above about 125 m^2/g, and

where $x = 0$, and M is cobalt, the surface area of the composition ranges above about 190 m^2/g.

ALC ALH

3,893,911

DEMETALLIZATION OF HIGH METALS FEEDSTOCKS USING REGENERATED CATALYST

William C. Rovesti, Levittown, Pa., and Ronald H. Wolk, Trenton, N.J., assignors to Hydrocarbon Research, Inc., New York, N.Y.

Filed June 24, 1974, Ser. No. 482,277

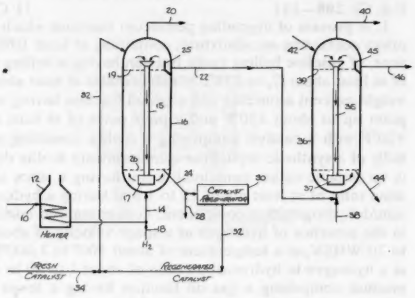
Int. Cl. C10g *23/00*

U.S. Cl. 208—251 H **10 Claims**

1. A method for demetallizing a petroleum residuum containing at least 10 ppm vanadium to obtain a product having at least 65% demetallization, wherein the residuum liquid and hydrogen are passed upwardly through a reaction zone containing a particulate catalyst at a rate sufficient to place the catalyst in random motion in the liquid but without substantial carryover of catalyst from the reaction zone and at conditions within the range of 1,000 to 3,000 psi hydrogen partial pressure, 700°–850°F temperature, and liquid space velocity of 0.2 to 2.0 $V_f/hr/V_r$, the improvement which comprises:

a. maintaining an initial charge of particulate catalyst within the reaction zone until its demetallization activity passes through a minimum value then increases and stabilizes at a relatively constant level and the catalyst contains at least about 0.5 wt. % vanadium with catalyst age exceeding about 0.3 bbl/lb;

b. then commencing withdrawal of used catalyst from the reaction zone at sufficient rate so as to maintain substantially the same stabilized demetallization activity level;



c. regenerating the withdrawn used catalyst so as to substantially remove the carbon deposits therefrom and yet retain the vanadium deposits;

d. returning the regenerated catalyst to the reaction zone at a rate approximately equal to the withdrawal rate so as to achieve a higher average vanadium removal activity in the reaction zone than by replacing the withdrawn used catalyst with fresh catalyst; and

e. withdrawing a liquid product from the reaction zone that is at least about 65 percent demetallized.

3,893,912

METHOD OF REMOVING ORGANOMETALLIC COMPOUNDS FROM LIQUID HYDROCARBONS

Abraham A. Zimmerman, New Providence, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Apr. 8, 1974, Ser. No. 458,668

Int. Cl. C10g *17/00*

U.S. Cl. 208—253 **15 Claims**

1. A method for separating an organolead compound from liquid hydrocarbons comprising the steps of first contacting a liquid hydrocarbon having an organolead compound dissolved therein with a pretreating agent selected from the group consisting of silicon tetrachloride, iodine, cupric chloride and cupric bromide and thereafter contacting the pretreated hydrocarbon with an adsorbent useful for separating lead compounds from liquid hydrocarbons selected from the group consisting of activated carbon, acid treated clays and silica gels, and then recovering a liquid hydrocarbon having a reduced dissolved lead content therein.

3,893,913

METHOD OF REMOVING ORGANOMETALLIC COMPOUNDS FROM LIQUID HYDROCARBONS

Abraham A. Zimmerman, New Providence, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Apr. 8, 1974, Ser. No. 458,669

Int. Cl. C10g *17/00*

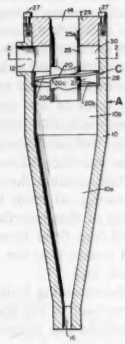
U.S. Cl. 208—253 **12 Claims**

1. A method for separating an organo lead compound from liquid hydrocarbons comprising the steps of contacting a liquid hydrocarbon containing an organo lead compound dissolved therein with a substantially amorphous activated carbon impregnated with cupric chloride and recovering a liquid hydrocarbon having a reduced dissolved lead content therein.

3,893,914
CYCLONE CENTRIFUGE APPARATUS

Roy A. Bobo, Suite 215, 2000 N. Loop West, Houston, Tex. 77018

Filed Apr. 5, 1973, Ser. No. 348,336
Int. Cl. B04c *3/06, 5/06*
U.S. Cl. 209—144 15 Claims



1. A cyclone centrifuge apparatus for separating or classifying at least two components of different densities, comprising:
a housing having a separating chamber with an inlet, a first outlet and a second outlet;
a choke assembly disposed in said chamber downstream of said inlet for creating vortical flow in said separating chamber;
a static flow chamber section between said inlet and said choke assembly;
said choke assembly controlling substantially all flow of fluid from said inlet and said flow chamber to the portion of the chamber downstream from said choke assembly, whereby said fluid enters said separating chamber from a substantially static inlet feed, preventing the inlet fluid from cutting across the fluid flow in said separating chamber; and
said choke assembly including:
a central vane support disposed in said housing and spaced radially therefrom to provide an annular area adjacent said static flow chamber; helical vane means in said annular area and having an inner edge contacting said central vane support and an outer area contacting said housing to direct all fluid from said static flow chamber across said vane means before entering the rest of the housing; and said vane means having at least two terminal vane ends which are longitudinally spaced from each other, with a downstream vane end extending substantially radially, and an upstream vane end overlapping said downstream vane end for a distance equal to approximately the radius of said central vane support and extending substantially parallel to said downstream end.

3,893,915
FLUORSPAR ORE FLOTATION

Venancio V. Mercade, Metuchen, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Menlo Park, Edison, N.J.

Filed June 14, 1973, Ser. No. 369,892
Int. Cl. B03d *1/02*
U.S. Cl. 209—166 5 Claims

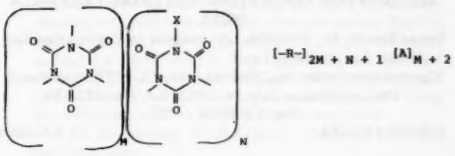
1. In the froth flotation of fluorite from a calcareous gangue with a fatty acid collector for the fluorite in an aqueous alkaline ore pulp, the improvement which consists in activating said pulp for the selective flotation of fluorite by adding a material selected from the group consisting of alkali metal bisulfite, alkali metal thiosulfate and mixtures thereof.

3,893,916
PRECIPITATION OF METALS FROM AQUEOUS SOLUTIONS

Perry A. Argabright, Larkspur; Larry M. Echelberger, and Brian L. Phillips, both of Littleton, all of Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Nov. 2, 1973, Ser. No. 412,056
Int. Cl. C02c *5/02*
U.S. Cl. 210—54 4 Claims

1. A method for the removal of metals by precipitation of of metal salts from aqueous solutions comprising dissolving into said aqueous solutions, polyisocyanurate salts which are soluble in said aqueous solutions wherein said polyisocyanurate salts are selected from the group consisting of alkali metal and ammonium salts of polyisocyanuric acids and wherein said metals are selected from the groups consisting of Al, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Ga, Ge, Y, Zr, Nb, Mo, Tc, Ru, Rh, Pd, Ag, Cd, In, Sn, Sb, Ba, La, Hf, Ta, W, Re, Os, Ir, Pt, Au, Hg, Tl, Pb, Bi, Ra, Ac, Th, Pa, and U, wherein said isocyanurate salts have the structure:



and wherein
R = a divalent radical containing 2 to about 40 carbon atoms
X = an alkali metal, alkaline earth metal, or quarternary ammonium radical or combination thereof;
A = a monovalent group selected from the following: isocyanate, urethane ($NHCO_2R'$), urea and amino radicals;
R′ = a monovalent radical containing 1 to about 40 carbon atoms
M = the average number of trisubstituted isocyanurate rings
N = the average number of isocyanurate acid and/or isocyanurate salt groups;
2M + N + 1 = average of divalent R groups
M + 2 = average number of A groups and wherein there are no N—to—N bonds and no A—to—N bonds, and no A—to—A bonds, and no R—to—R bonds, and wherein said polyisocyanurate salts are present in a ratio equivalent to from about 0.5 to about 5 moles of basic isocyanurate salt groups for each mole of metals present in said aqueous solutions to be treated.

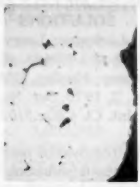
3,893,917
MOLTEN METAL FILTER

Michael J. Pryor, Woodbridge, Conn., and Thomas J. Gray, Halifax, Canada, assignors to Swiss Aluminium Limited, Chippis, Switzerland

Filed Jan. 2, 1974, Ser. No. 430,229
Int. Cl. B01d *23/02*
U.S. Cl. 210—69 9 Claims

1. A low cost method of filtering molten metal through a disposable filter which comprises: providing a mass of molten metal; providing a ceramic foam material having an open cell structure characterized by a plurality of interconnected voids surrounded by a web of said ceramic, said ceramic foam

material having a density of less than 30% of the theoretical density for a ceramic material of the same size, said ceramic foam material being formed by impregnating an open cell flexible organic foam having a plurality of interconnected voids surrounded by a web of said foam with an aqueous ceramic slurry so that the web is coated therewith and the



voids are filled therewith, expelling slurry therefrom while leaving the web coated therewith, drying said coated foam and heating the dried coated foam to form said ceramic foam; and pouring said molten metal through said ceramic foam material at a rate of from 5 to 500 cubic inches per square inch of filter area per minute, thereby removing entrained solids from said molten metal.

3,893,918

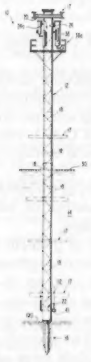
METHOD FOR SEPARATING MATERIAL LEAVING A WELL

Uncas Favret, Jr., Metairie, La., assignor to Engineering Specialties, Inc., Kenner, La.

Continuation of Ser. No. 201,091, Nov. 22, 1971, abandoned. This application July 24, 1973, Ser. No. 382,156

Int. Cl. B01d *17/02*

U.S. Cl. 210—84 **6 Claims**



1. A method of recovering oil from an oil-containing fluid mixture at an oil-handling facility located adjacent a body of water and disposing of the relatively oil-free fluid into the body of water, the method utilizing an elongate separator conduit means, the method comprising:

disposing the separator conduit means in a generally upwardly extending posture with an exit zone thereof in continuous communication with the body of water beneath the surface thereof to establish within the separator conduit means a fluid column to a height responsive to the mean water level of the body of water; supplying an oil-containing fluid mixture into the fluid column within the separator conduit means to cause the fluid in the separator conduit means to flow downwardly through a flowing zone established along the separator conduit means and over a plurality of baffle means spaced along the flowing zone to induce coalescent separation of oil from the fluid;

intermittently interrupting the supply into the fluid column to impede the downward velocity of fluid in the flowing zone for a waiting time period sufficient to permit oil to rise from the flowing zone into quiescent zones defined by the baffle means adjacent the undersides thereof;

flowing oil accumulated in the quiescent zones upwardly in the separator conduit means along a flow path essentially isolated from the downward flowing zone to the upper region of the fluid column therewithin so as to establish an upper oil layer of the fluid column;

said oil flowing step including the step of flowing oil accumulated in lower ones of the quiescent zones through upper ones of the quiescent zones;

sensing, at a location below the mean water level of the body of water, the interface between the upper oil layer and fluid of the fluid column therebelow;

controllably withdrawing oil from that upper oil layer in response to sensing of that interface;

flowing relatively oil-free fluid from the exit zone of the separator conduit means into the body of water beneath the surface thereof; and

the supply of the oil-containing fluid mixture into the fluid column being at a level in the separator conduit means below a predetermined low interface level.

3,893,919

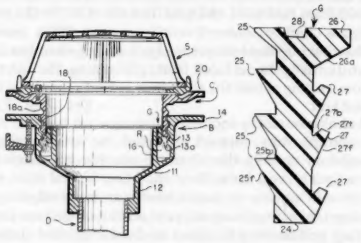
ADJUSTABLE TOP DRAIN AND SEAL

George J. Flegel, Michigan City, Ind., and William L. Zopfi, Ferndale, Mich., assignors to Josam Manufacturing Co., Michigan City, Ind.

Filed Oct. 31, 1973, Ser. No. 411,447

Int. Cl. B01d *23/00*

U.S. Cl. 210—166 **6 Claims**



1. In a combination, with a roof drain comprising, as a top inlet portion, an adjustable collar having a male-threaded downward annularly cylindrical extension vertically adjustably threadedly engaged in a female-threaded bowl as a drain bottom portion having a drain outlet, the bowl having an annular caulking recess receiving the bottom end of the threaded extension, said recess being defined by an upwardly open cylindrical integral bowl caulking flange coaxially spaced inwardly from the female-threaded bowl portion and circumferentially joined to the bowl below the bottom end of the female thread thereof, said flange being coaxially spaced also from the cylindrical interior of the collar extension;

a collar-to-bowl seal provided by a resilient elastomeric sleeve gasket, said gasket comprising

a cylindrical body,

a heavy continuous inward peripheral lip projecting from the top end of the body inwardly over, and having an undersurface continuously sealingly engaged with, a top edge of the said caulking flange,

a set of at least two upwardly sloped, circumferentially continuous, internal thin fins axially spaced on said body under the said lip, and

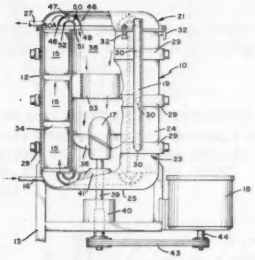
a set of at least two upwardly sloping, heavy circumferentially continuous external ribs axially spaced on said body,

said sets making sealing contacts respectively with the flange exterior and collar interior cylindrical surfaces.

3,893,920
MEMBRANE SEPARATION EQUIPMENT

Peter J. Hubbard, Darien, and Eric L. Sandstrom, Bethel, both of Conn., assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Filed May 3, 1973, Ser. No. 356,727
Int. Cl.[2] B01D *31/00*
U.S. Cl. 210—197 **11 Claims**



1. Apparatus for housing in operative relationship a plurality of individual ultrafiltration separation units each having a plurality of semi-permeable membrane surfaces for separating solids from a carrier liquid fed to said apparatus, said apparatus comprising:

a. an enclosed casing having inner and outer sidewall surfaces;

b. inlet means for receiving the carrier liquid and outlet means for discharging a concentrated solution both provided on said casing,

c. means mounting said separation units in spaced relationship within said casing upon said inner sidewall surfaces,

d. permeate outlet means extending from each of said separation units through said casing sidewalls,

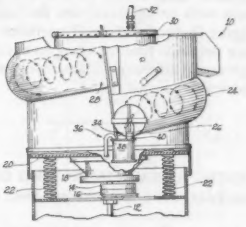
e. liquid circulation and solids concentrating means provided within said casing for directing said carrier liquid fed to said casing across the membrane surfaces of said separation units,

f. said circulation and solid concentrating means including an open circulation conduit provided within said casing and spaced from said separation units for providing an uninterrupted flow path for the carrier liquid and pump means within said conduit operable to direct said carrier liquid through said conduit and across the membrane surfaces of all of said separation units, said pump means further operable to recirculate the carrier liquid containing said concentrated solids through the open circulation conduit in a continuous path until a selected concentrated solids level is effected.

3,893,921
FLOCCULATION DEVICE FOR WASTE FLUID TREATMENT

Carl Kurt Walther, Wuppertal-Vohwinkel; Klaus Beckschäfer, Kaarst, and Karl E. Temme, Wuppertal, all of Germany, assignors to Wheelabrator-Frye Inc., New York, N.Y.

Filed Nov. 27, 1973, Ser. No. 419,261
Int. Cl. B01f *9/00*
U.S. Cl. 210—206 **4 Claims**



1. An apparatus for flocculation of a waste fluid discharge comprising:

a vibrational treatment device;

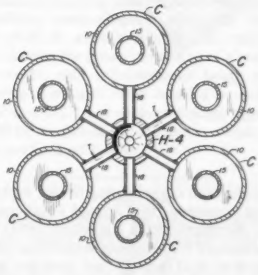
a tank connected to and vibrating with said treatment device and receiving said waste fluid via a first inlet communicating with said tank adjacent a bottom surface thereof; means for supplying a flocculating agent to said tank including a second inlet in the proximity of said first inlet through which said flocculating agent is injected into said tank to effect flocculation of said waste fluid upon mixing therewith due to the vibration of said tank; and

means for discharging the floccule-containing waste fluid from said tank.

3,893,922
CYLINDRICAL CYCLONE CENTRIFUGES

Roy A. Bobo, 2000 N. Loop West, Suite 215, Houston, Tex. 77018

Filed Dec. 14, 1972, Ser. No. 315,233
Int. Cl. B04c *3/06*
U.S. Cl. 209—211 **6 Claims**



1. Cyclone centrifuge apparatus, comprising:

a cylindrical separator tank having an upper inlet and a lower outlet, and a cylindrical vertical tank wall, which is entirely cylindrical, between said inlet and said outlet;

means for directing a feed fluid having solid particles of various weights therewith from said inlet in a direction to create a cyclone flow of such fluid within said tank to effect a separation of the solid particles into a heavy phase near said wall of said tank and a light phase towards the center of said tank;

said tank having a closed lower end with said lower outlet for the discharge of the light phase from said tank;

a heavy phase fluid outlet in the wall of said tank near its lower end for the discharge of the heavy phase of the solid particles; and

heavy phase control means connected to said heavy heavy fluid outlet only and having a plurality of means therewith for creating substantially equal successive pressure drops in the fluid discharging for thereby creating a predetermined pressure drop in the fluid discharging with said heavy phase with an adequate size for said outlet to inhibit plugging thereof with solid particles in said heavy phase while the same time avoiding an excessive pressure drop which would interfere with the cyclone separation in said cylindrical separator tank.

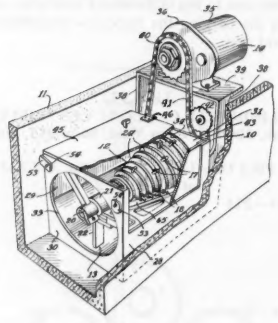
3,893,923
SCREENING AND COMMINUTING DEVICE

Stanley P. Rudzinski, 1156 S. Lombard Ave., Oak Park, Ill. 60304

Continuation-in-part of Ser. No. 329,585, Feb. 5, 1973, Pat. No. 3,812,967. This application May 23, 1974, Ser. No. 472,681The portion of the term of this patent subsequent to May 28, 1991, has been disclaimed.

Int. Cl. B01d *33/00*

U.S. Cl. 210—161 **9 Claims**



1. In a screening and comminuting device including a rotor having co-axial screening rings spaced apart axially to form fluid passages therebetween, a stationary cutter support bar and support structure for rotatably supporting said rotor in a channel for flow of fluid through said passages and for maintaining said support bar in fixed relation to the upstream surface of said rotor, the combination comprising movable cutter bits mounted on said rings, each bit having a cutting edge portion extending generally axially of the rotor and projecting from the upstream side of said rings, and stationary cutter bits mounted on said support bar, each of said stationary bits having a cutting edge aligned for coaction with said cutting edge of a respective one of said bits on said rings; said stationary bits also having a radially extending portion projecting into a respective one of said passages between adjacent ones of said rings for removing solid material deposited in said passage.

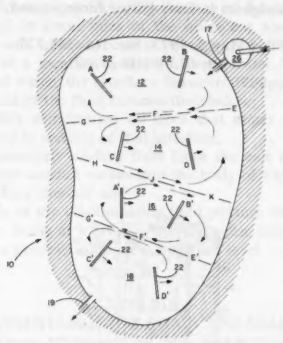
3,893,924
AEROBIC LAGOON WASTE TREATMENT SYSTEM AND METHOD

Archie R. Le Compte, Jr., Neenah, and David W. Appel, Oshkosh, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 19, 1973, Ser. No. 407,922

Int. Cl. C02c *1/12*

U.S. Cl. 210—220 **6 Claims**



1. Aerobic waste treatment system comprising, in combination,

a. a lagoon for receiving waste-containing liquids, said lagoon including at least one circulation cell having a length, α, width, β, and liquid depth, Σ; and

b. unidirectional ejector manifolds having a length, Δ, positioned at a plurality of locations within said cell at a depth, Γ, in said receiving means and wherein the ejectors are substantially horizontally directed to induce a primary circulation pattern around each cell having an average velocity of at least about 0.3 foot per second and a helical secondary circulation pattern within said cell so as to substantially reduce the tendency of solids to settle within said cell and form sludge; wherein α/β is between 1 and 3, Δ/β is between 0.25 and 0.45, and Γ/Σ is greater than 0.5.

3,893,925
OIL SEPARATOR WITH COALESCING MEDIA

Loyd W. Jones, Tulsa, Okla., assignor to Amoco Production Company, Tulsa, Okla.

Filed Aug. 16, 1971, Ser. No. 171,822

Int. Cl. B01d *17/04*

U.S. Cl. 210—266 **9 Claims**

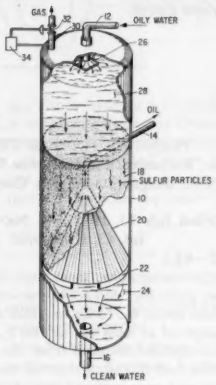
8. A downflow apparatus for removing finely dispersed oil from oily water which comprises:

a vessel having an oily water inlet at the top thereof, a water outlet at the bottom, and an oil outlet intermediate said oily water inlet and said water outlet;

a bed of particles in said vessel having a coalescing effect on oil;

an inverted cone member in and extending across said vessel forming a bottom support for said bed, said in-

verted cone member being perforated and provided with a plurality of protected channels for collecting coalesced



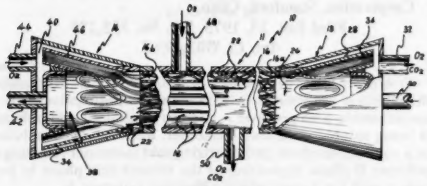
oil and extending from the lower edge of the core members to its apex which is connected to said oil outlet.

3,893,926

MEMBRANE FLUID DIFFUSION EXCHANGE DEVICE

John A. Awad, 632 Charron, Ste-Foy, Quebec, Canada

Filed July 24, 1973, Ser. No. 382,110
Int. Cl. A61m *1/03*; **B01d** *13/00*
U.S. Cl. 210—321 **12 Claims**



1. A membrane fluid diffusion exchange device comprising: a housing defining a closed chamber therein; a plurality of tubular diffusing membranes extending through said chamber; first inlet and outlet means opening in said chamber for circulating a treating fluid therein over the external surfaces of said tubular membranes; second inlet and outlet means provided in said housing for circulating in said tubular membranes a fluid to be treated; a plurality of capillary diffusing membranes disposed in each of said tubular membranes; and third inlet and outlet means provided in said housing for circulating a similar treating fluid in said capillary membranes; said treating fluid diffusing through the walls of said tubular membranes and said capillary membranes to treat said fluid circulating in said tubular membranes.

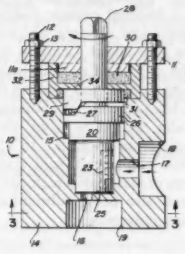
3,893,927

FILTERED THROTTLING VALVE

Ramsey L. Cronfel, 1391 Cumberland, Elk Grove, Ill. 60007

Filed July 27, 1973, Ser. No. 383,181
Int. Cl. B01d *29/20*; **F16k** *1/52*
U.S. Cl. 210—418 **6 Claims**

1. A pressure valve for throttling flow comprising a valve body having an inlet port and an outlet port, control means in said body for providing a fluid communication from said inlet to said outlet, said control means including a descending well extending from the top of said body to said outlet port and being in communication with said inlet port, an elongated valve stem movably mounted in said well for controlled axial and rotary motion, seating means within said well around said outlet port for cooperating with said valve stem to throttle the flow, movement means for imparting axial and rotary motion to said valve stem, and said valve stem having internal transfer passages which cooperate with said seating means when said valve stem is in a valve throttling position allows fluid flow



through said transfer passages between said inlet and outlet ports and when said stem is cammed into a valve seated position prevents fluid flow through said transfer passages between said inlet and outlet ports; filtering means integral with said transfer passages and having a filtering inlet area which is greater than the filtering outlet area and being arranged to strain the throttled flow, packing means for movably sealing said valve stem at the upper part of said body to prevent fluid from leaking from said body.

3,893,928

CARBONACEOUS COMPOSITE MATERIAL AND PROCESS FOR PREPARING SAME

Katsuhiro Ono; Haruo Shikuma; Tadao Shigeta; Toshihide Nishimura, and Makoto Kitamura, all of Chiba, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo-to, Japan

Filed July 14, 1972, Ser. No. 271,736
Claims priority, application Japan, July 17, 1971, 46-53284; July 20, 1971, 46-54465
Int. Cl. B32b *5/16*
U.S. Cl. 252—1 **2 Claims**

1. Carbonaceous composite material consisting essentially of discrete hollow vitreous microspheres and powdered inorganic reinforcing agent generally uniformly distributed in a carbonized pitch or asphalt binder, said reinforcing agent being selected from the group consisting of a metal, metal salt, and metal oxide, said microspheres being present in an amount having a weight ratio relative to said carbonized binder of about 4:1–1:1 and said reinforcing agent constituting about 1–20% by weight of the aggregate weight of the microspheres and carbonized binder.

3,893,929

COMPOSITIONS FOR IMPARTING RENEWABLE SOIL RELEASE FINISH TO POLYESTER-CONTAINING FABRICS

Marino S. Basadur, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 193,569, Oct. 28, 1971, abandoned. This application Feb. 1, 1973, Ser. No. 328,824
Int. Cl. D06m *13/20*
U.S. Cl. 252—8.6 **11 Claims**

1. A composition of matter, particularly suitable for use in preparing dilute aqueous acidic baths wherein a renewable soil release finish is applied to polyester-containing fabrics, said compositions comprising from about 5 percent to about 97.5 percent by weight of a soil release agent, said soil release agent being a copolymer comprising

1. a dibasic carboxylic acid of the following general formula
HOOCH-A-COOH
wherein A is a bivalent organic radical selected from the group consisting of alkylene, arylene, aralkylene, alkarylene and cycloalkylene radicals having from 3 to about 14 carbon atoms,
2. a glycolic compound which is a polyglycol selected from the group consisting of compounds of the following general formula

$$H[\text{-O-B-}]_nOH$$

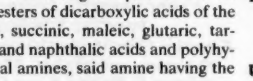
wherein B is a bivalent organic radical selected from the group consisting of alkylene and cycloalkylene radicals having from 2 to about 4 carbon atoms, and wherein n indicates the degree of polymerization and ranges from about 6 to about 500, and wherein the ratio of dicarboxylic acid to total glycolic compounds is 1:1 and the average molecular weight is from about 1,000 to about 100,000, and from about 2.5 to 95 percent of a water soluble acidic compound, said composition being substantially free of materials which cause swelling of polyester fibers and also being substantially free of synthetic acid emulsion polymers.

3,893,930
DETERGENT-SOFTENER COMPOSITIONS CONTAINING ESTERS OF DICARBOXYLIC ACIDS AND POLYHYDROXY TERTIARY AMINES

Bjorn Sundby, Piscataway, and Harold Eugene Wixon, New Brunswick, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 6, 1971, Ser. No. 205,290
Int. Cl. D06m *13/20*
U.S. Cl. 252—8.8 **15 Claims**

1. A detergent composition having inherent softening properties containing as essential ingredients about 5–30 percent weight of a dual detergent and softening compound selected from the group consisting of esters of dicarboxylic acids of the group consisting of phthalic, succinic, maleic, glutaric, tartaric, malic, adipic, diphenic and naphthalic acids and polyhydroxy tertiary mono functional amines, said amine having the structural formula:



wherein R_1 is an alkyl radical of 8 to 24 carbon atoms, R_2 is an alkyl or alkylol radical containing 1 to 6 carbon atoms, and R_3 is an alkylol radical containing 1 to 6 carbon atoms and the alkali metal, ammomium, mono-, di- and trialkyl, or mono-, di- and trialkanol amines salts of said ester in which the alkyl and alkanol groups of the amine contain from 1 to 4 carbon atoms salts thereof and about 70-95 percent by weight of water-soluble builder salt.

3,893,931
ESTER LUBRICANTS SUITABLE FOR USE IN AQUEOUS SYSTEMS

Robert J. Sturwold, and Fred O. Barrett, both of Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

Division of Ser. No. 384,674, Aug. 1, 1973, Pat. No. 3,857,865.
This application July 22, 1974, Ser. No. 490,874
Int. Cl.[2] C10M *1/06, 3/04, 5/04, 7/08*
U.S. Cl. 252—49.5 **4 Claims**

1. An aqueous lubricant composition suitable for metalworking and having improved rust protection properties containing about 0.1 to about 25 percent by weight of an ester comprising the condensation product of 0.05 to about 0.5 equivalent polyoxyalkylene glycol having a molecular weight from about 200 to about 1000 and having repeating alkylene units containing from 2 to 4 carbon atoms, 0.5 to 0.95 equivalent monofunctional alcohol of the formula ROH where R is an aliphatic hydrocarbon radical containing from 1 to about 20 carbon atoms and 1.0 equivalent of an aliphatic dibasic acid containing from about 30 to 60 carbon atoms, said ester having an acid value less than 25, a hydroxyl value less than 25 and containing about 2 to about 40 percent by weight polyoxyalkylene glycol.

3,893,932
PRESSURE FIXABLE TONER

Jack C. Azar, Rochester, and Marianne C. O'Neill, Macedon, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed July 13, 1972, Ser. No. 271,330
Int. Cl. G03g *9/00*
U.S. Cl. 252—62.1 **2 Claims**

1. An electrostatographic toner material comprising finely divided toner particles, said toner particles having a particle size range from about 0.5 to about 1000 microns and a blocking temperature of at least about 100°F, said toner material comprising a colorant selected from the group consisting of pigments, dyes and mixtures thereof, an adhesive soft solid core material said core material including the reaction product of isopropylidenediphenoxypropanol and adipic acid and a plasticizer encapsulated in a shell material.

3,893,933
PROCESS FOR PRODUCING ENCAPSULATED TONER COMPOSITION

Robert Warren Brown, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 23, 1973, Ser. No. 335,279
Int. Cl. G03g *9/02*
U.S. Cl. 252—62.1 **5 Claims**

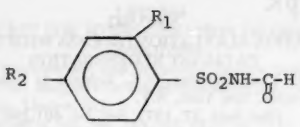
1. A process for producing encapsulated toners comprising dissolving a polymer A in a monomer whose polymer B is incompatible with polymer A to form a solution, said polymer B being soluble in its own monomer, dispersing said solution in a continuous phase, polymerizing said monomer resulting in polymer B phase separating as the solvent-rich phase to provide a wall for a core which comprises polymer A.

3,893,934
SOLID DEVELOPER FOR ELECTROSTATIC LATENT IMAGES

Robert A. Braun, and Robert Mermelstein, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 26, 1973, Ser. No. 336,158
Int. Cl. G03g *9/02*
U.S. Cl. 252—62.1 **10 Claims**

1. A solid electrostatographic developer material comprising particles, said particles including finely-divided toner material having a particle size of up to about 30 microns, a melting point of at least about 110°F, a melt viscosity of less than about 2.5×10^{-4} poise at temperatures up to about 450°F, said toner material comprising a colorant selected from the group consisting of pigments, dyes, and mixtures thereof, a thermoplastic resin consisting essentially of a vinyl polymer having a melting point of at least about 110°F, and from about 5 percent to about 55 percent by weight, based on the weight of said vinyl polymer, of an arylsulfonamide formaldehyde adduct having a melting point between about 50°F and about 250°F and having the general structure



wherein R_1 and R_2 are either hydrogen or methyl provided that where R_1 or R_2 is methyl, the other is hydrogen.

7. A solid electrostatographic developer material according to claim 1 wherein said finely-divided toner particles are electrostatically coated on the surface of carrier particles having an average particle diameter between about 50 to about 1,000 microns.

3,893,935
ELECTROGRAPHIC TONER AND DEVELOPER COMPOSITION

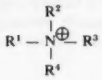
Thomas A. Jadwin; Alec N. Mutz, and Bruce J. Rubin, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 257,524, May 30, 1972, abandoned. This application Sept. 20, 1973, Ser. No. 399,226

Int. Cl. G03g *9/00*

U.S. Cl. 252—62.1 **18 Claims**

1. A dry particulate electroscopic toner composition for use in developing electrostatic charge patterns comprising finely-divided particles comprising a resin having incorporated therein a quaternary ammonium charge control agent having the following formula:



wherein R^1, R^2, R^3 and R^4 represent an aliphatic hydrocarbon group having one to seven carbon atoms and X^- represents an anionic function.

3,893,936
CONTROL OF BACTERIA WITH DETERGENT OR CLEANING COMPOSITIONS CONTAINING PHENYLTHIOUREAS

Adolf Hubele, Riehen, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

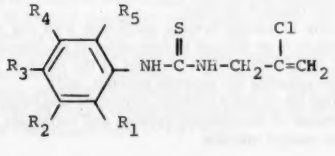
Division of Ser. No. 34,594, May 4, 1970, abandoned. This application May 8, 1972, Ser. No. 250,937

Claims priority, application Switzerland, May 7, 1969, 7008/69; July 25, 1969, 11440/69. The portion of the term of this patent subsequent to May 21, 1991, has been disclaimed.

Int. Cl. C11d *3/48*

U.S. Cl. 252—106 **15 Claims**

1. A method for controlling bacteria comprising applying to an area infested with said bacteria a detergent or cleaning composition comprising bacteriostatically effective amount of a compound of the formula



in which each of R_1, R_2, R_3, R_4 and R_5 is hydrogen, chlorine, bromine, nitro, alkyl of from 1 to 4 carbon atoms, or trifluoromethyl.

3,893,937
WETTING AGENTS FOR ALKALINE BATHS

Franz Landauer, Frankfurt am Main; Claus Beermann, Neu-Isenburg; Martin Reuter, Kronberg, Taunus; Karl Heinz Lebkucher, Hofheim, Taunus, and Hubert Kiesling, Schwalbach, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 99,264, Dec. 17, 1970, Pat. No. 3,730,903, which is a continuation-in-part of Ser. No. 701,119, Jan. 29, 1968, abandoned. This application Feb. 12, 1973, Ser. No. 331,467

Claims priority, application Germany, Feb. 2, 1967, 1619040The portion of the term of this patent subsequent to May 1, 1990, has been disclaimed.

Int. Cl. C11d *7/12*

U.S. Cl. 252—156 **5 Claims**

1. Detergent mixture consisting essentially of

a. about 10 to about 80 percent by weight of an alkyl sulfonic acid derived from light petrol boiling at 30°– 80°C or an alkali metal salt thereof, having on an average one sulfonic acid group per 7 carbon atoms at most or a mixture thereof,

b. about 20 to about 85 percent by weight of an amine of the formula

$$R - N\,[\,(C_nH_{2n}{-}O)_mH]\,2$$

in which R is alkyl of 2 to 5 carbon atoms, n is 2 or 3 and m is a number of 1 to 2, and

c. about 1 to about 15 percent by weight of a phosphoric acid ester of alkanols of 4 to 8 carbon atoms.

3,893,938
CHEMILUMINESCENT ARTICLE OF BIS-ESTER OF OXALIC ACID AND METHOD OF PROVIDING CHEMILUMINESCENT LIGHT

Michael McKay Rauhut, Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 162,698, July 14, 1971, abandoned, which is a continuation of Ser. No. 741,517, July 1, 1968, abandoned. This application May 14, 1973, Ser. No. 360,287

Int. Cl. C09k *3/00*

U.S. Cl. 252—188.3 CL **5 Claims**

1. An article of manufacture comprising a substrate in sheet form having incorporated therewith a chemiluminescent component comprising a bis-ester of oxalic acid, said substrate being inert to said component.

4. A method for providing chemiluminescent light which comprises applying to a substrate having an oxalate-type chemiluminescent component incorporated therewith as in claim 1, a vapor capable of causing a reaction with said oxalate in the presence of a fluorescer, to produce chemiluminescence.

3,893,939
ACTIVATED PHOSPHORS HAVING MATRICES OF YTTRIUM-TRANSITION METAL COMPOUND

Edward L. De Kalb, and Velmer A. Fassel, both of Ames, Iowa, assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 4, 1973, Ser. No. 321,064

Int. Cl. C09k *1/36*

U.S. Cl. 252—301.4 P **2 Claims**

1. A luminescent phosphor composition comprising an iron-yttrium phosphate as a matrix host having a stoichiometric composition of $Y_xFe_yPO_4$ where x is about 0.8 and y is about 0.2, said matrix host incorporating a quantity of activator element in effective amount in excess of 5 ppm by weight to produce detectable luminescence on X-ray excitation, said

activator element selected from the group of fluorescing lanthanides consisting of Ce, Pr, Nd, Sm, Eu, Tb, Dy and Er.

3,893,940

METHOD OF MANUFACTURING SURFACE ACTIVE AGENT HAVING LOW CONTENT OF UNREACTED OIL

Toshiaki Ohogoshi, and Akira Kawakami, both of Funabashi, Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Oct. 31, 1972, Ser. No. 302,511
Claims priority, application Japan, Nov. 5, 1971, 46-87682
Int. Cl. B01f *17/02*
U.S. Cl. 252—353 **9 Claims**

1. A method of removing unreacted oil from a member of the group consisting of a salt of (A) a sulfate and (B) a sulfonate of an oil selected from the group consisting of (1) olefin having 12 to 22 carbon atoms, (2) paraffin having 12 to 22 carbon atoms, (3) aliphatic monohydric alcohol having eight to 22 carbon atoms, and mixtures of said salts, said salt containing an appreciable amount of unreacted oil, which comprises: mixing a material consisting essentially of an aqueous solution of said salt containing said unreacted oil, with 0.1 to 10.0 times as much, based on the weight of said salt, of a substance selected from the group consisting of (a) a polyhydric alcohol, (b) a polyoxyalkylene alkyl ether, (c) a polyoxyalkylene alkyl phenyl ether, and (d) mixtures of (a), (b) and (c), said substance being essentially the only treating agent added to said solution, and then subjecting the resulting liquid mixture consisting essentially of said aqueous solution of said salt, said oil and said substance, to stripping to remove said unreacted oil.

3,893,941

FOAM INHIBITING COMPOSITION

Raymond J. Michalski, Riverdale, and Chappelle C. Cochrane, Maywood, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Division of Ser. No. 179,161, Sept. 9, 1971, Pat. No. 3,772,207. This application July 11, 1973, Ser. No. 378,378
Int. Cl. B01d *19/04*
U.S. Cl. 252—358 **3 Claims**

1. A foam inhibiting composition for inhibiting foaming in aqueous systems having a pH within the range of 1 to 7.5 comprising:

	Ingredients	Parts by Weight
(A)	A long chain water insoluble, oil insoluble amide having one or more hydrogen atoms attached to the amide nitrogen atom substituted by a hydrocarbon group containing 6 to 24 carbon atoms, said amide being selected from the group consisting of sulfamides, ureas and thioureas,	2–10
(B)	A water insoluble, oil insoluble copolymer of ethylene and polyvinyl acetate having a weight average molecular weight within the range of 300 to 1000 which has been saponified to replace acetate groups by hydroxyl groups	2–10
(C)	A water insoluble hydrocarbon oil	65–90

and a sufficient amount of a surfactant having an HLB value within the range of 8 to 12 to act as a spreading agent for said composition in said aqueous system, the weight ratio of (A) to (B) being within the range of 5:1 to 1:5.

RDK

3,893,942

ISOPARAFFIN ALKYLATION PROCESS WITH PERIODIC CATALYST REGENERATION

Chang-Lee Yang, Ossining, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Sept. 27, 1973, Ser. No. 401,396
Int. Cl. B01j *11/02*
U.S. Cl. 252—411 **5 Claims**

1. In an alkylation process in which an olefin containing from two to five carbon atoms inclusive is contacted and reacted with isobutane in a catalytic conversion zone containing a catalyst composition comprising at least one hydrogenation agent of the group nickel, platinum, palladium rhodium and ruthenium and a three-dimensional crystallene zeolitic molecular sieve having a pore size large enough to adsorb 2,2,3 trimethylpentane, an alkali metal content less than 3.5 weight percent based on the weight of dehydrated zeolite and an SiO_2/Al_2O_3 molar ratio of at least 2.0, said contact being continued until the alkylation activity of the catalyst has decreased, the improvement which comprises contacting and hydrogenating said catalyst composition having decreased activity with hydrogen gas at a partial pressure of from 0.01 to 1000 atmospheres and at a temperature of from 80°F to 572°F for a sufficient period of time to improve the alkylation activity of the catalyst, and thereafter again contacting said hydrogenated catalyst composition with a feed stock comprising a monoolefin and isobutane under the said alkylation conditions without an intervening oxidative regeneration of said catalyst composition.

3,893,943

NOVEL CATALYST AND PROCESS FOR PREPARING THE SAME

John W. Willard, Sr., Rapid City, S. Dak., assignor to CAW Industries, Inc., Rapid City, S. Dak.

Continuation of Ser. No. 108,198, Jan. 20, 1971, abandoned. This application Dec. 20, 1972, Ser. No. 317,097
Int. Cl. B01j *11/32, 11/40*
U.S. Cl. 252—428 **39 Claims**

1. A process for preparing a catalyst comprising

admixing a water soluble alkali metal silicate with an aqueous medium containing a dissolved substance which is a source of calcium ion and a dissolved substance which is a source of magnesium ion,

the aqueous medium containing said dissolved substances in amounts to provide between about 1×10^{-4} and 1×10^{-1} mole per liter each of calcium ion and magnesium ion,

the aqueous medium containing said dissolved substances in amounts to provide a molar ratio of calcium ion to magnesium ion between about 2.0:1.0 and 1.0:2.0;

the alkali metal silicate having an alkali metal oxide to silicon dioxide ratio between about 0.9:1.0 and less than 2.0:1.0 and being admixed with the aqueous medium in an amount of about 0.05–2 moles per liter,

reacting the alkali metal silicate with said dissolved substances providing calcium ion and magnesium ion to produce an aqueous suspension of finely divided particles of the reaction product,

admixing a micelle-forming surfactant with the aqueous medium in an amount to form catalyst micelles comprising said finely divided particles of the reaction product upon agitating the aqueous medium, and

agitating the aqueous medium containing said finely divided particles of the reaction product and surfactant to form said catalyst micelles.

3,893,944

CATALYST FOR HYDROGENATION OF ORGANIC COMPOUNDS

Joseph Z. Mertzweiller, and Horace M. Tenney, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation of Ser. No. 253,762, May 16, 1972, Pat. No. 3,758,614, which is a continuation-in-part of Ser. No. 1,282, Jan. 7, 1970, Pat. No. 3,677,970, which is a continuation-in-art of Ser. No. 674,097, Oct. 10, 1967, abandoned. This application Apr. 9, 1973, Ser. No. 349,113. The portion of the term of this patent subsequent to July 18, 1989, has been disclaimed.

Int. Cl. B01j *11/06*

U.S. Cl. 252—431 C 7 Claims

1. A catalyst composition formed by the process of:

impregnating a support containing at least about 0.1 millimoles of hydroxyl groups per gram of support with an aqueous solution of a salt of a transition metal wherein the transition metal is selected from the group consisting of Groups IB, IVB, VB, VIB, VIIB and VIII metals and mixtures thereof;

heat-treating the impregnated support at a temperature of at least about 500°F.;

activating the heat-treated impregnated support by contacting same with an organometallic compound having the formula: QR_n wherein Q is selected from Groups I, II and III metals of the Periodic Chart of the Elements, R is selected from the group consisting of hydride, alkyl, aryl, alkylaryl, arylalkyl and cycloalkyl radicals containing up to about 20 carbon atoms and wherein *n* ranges from 1 to 3 and satisfies the valance of Q;

treating the activated supported metal complex in the presence of hydrogen at a temperature of at least about 300°F.; and

contacting the hydrogen-treated activated supported metal complex with a gaseous stream containing hydrogen sulfide at a temperature of from about 0°F. to about 1,000°F.

3,893,945

CATALYST COMPOSITION FOR OXIDATION OF BUTENES

Masao Kobayashi; Minoru Ikeda; Kantaro Yamada, and Hiromichi Ishii, all of Ohotake, Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

Filed Nov. 5, 1973, Ser. No. 412,680

Claims priority, application Japan, Nov. 13, 1972, 47-113724; Nov. 20, 1972, 47-116443; Nov. 20, 1972, 47-116444

Int. Cl. B01j *11/82*, *11/22*

U.S. Cl. 252—435 5 Claims

1. The catalyst composition for the vapor-phase oxidation of butenes at a temperature in the range of 250°–450°C which oxidizes n-butenes and iso-butene respectively to 1,3-butadiene and methacrolein respectively, consisting essentially of:

a first component of a mixture of oxides of tungsten, molybdenum, tellurium and antimony, wherein the W/Mo atomic ratio ranges from 0.01 to 100, the Te/(W+Mo) atomic ratio ranges from 0.01 to 0.2, and the Sb/(W+Mo) atomic ratio ranges from 0.01 to 1;

a second component of one metal oxide mixture of nickel and cobalt; nickel and iron; nickel, cobalt and bismuth; or nickel, iron and bismuth; wherein the atomic ratio of the combined metals of each metal oxide mixture to W+Mo is in the range of 0.08–2 and wherein the atomic ratio of the individual metals of each metal oxide mixture to W+Mo is in the range of 0.02–1; and

a third component of at least one alkali metal oxide selected from the group consisting of potassium, rubidium and cesium, wherein the atomic ratio of the alkali metal of each alkali metal oxide or each alkali metal oxide mixture to W+Mo ranges from 0.0005 to 0.3.

3. The catalyst composition of claim 1, which further comprises the presence of phosphorous oxide, wherein the P/(W+Mo) atomic ratio has an upper limit of 1.

3,893,946

DEHYDRATION CATALYSTS, PARTICULARLY FOR THE DEHYDRATION OF DIOLS

Joseph Edouard Weisang; Georges Szabo, both of Le Havre, and Jean Maurin, Montivilliers, all of France, assignors to Compagnie Francaise de Raffinage, Paris, France

Continuation of Ser. No. 132,892, April 9, 1971, Pat. No. 3,781,222. This application Sept. 11, 1973, Ser. No. 396,219

Claims priority, application France, Apr. 16, 1970, 70.13791The portion of the term of this patent subsequent to Dec. 25, 1990, has been disclaimed.

Int. Cl. B01j *11/82*

U.S. Cl. 252—437 2 Claims

1. A dehydration catalyst for vicinal diols prepared by a method consisting essentially of forming an intimate mixture of finely divided solid particles of at least one pyrophosphate and at least one acid orthoposphate of at least one metal belonging to the group consisting of lithium, sodium, strontium, and barium into a formed mass and calcinating said mass to transform said acid orthophosphate into pyrophosphate.

AJB ALH

3,893,947

GROUP VI-B METAL CATALYST PREPARATION

Dean Arthur Young, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Sept. 10, 1973, Ser. No. 395,624

Int. Cl. B01j *11/74*, *11/06*

U.S. Cl. 252—439 6 Claims

1. A method for producing a particle-form catalyst consisting essentially of a refractory inorganic oxide support and a hydrogenation component, said hydrogenating component consisting essentially of at least one Group VI-B metal constituent selected from the group consisting of molybdenum, tungsten and catalytically active compounds thereof, which method consists essentially of forming a particle-form combination of said refractory oxide support, a combustible support modifier and at least one Group VI-B metal compound selected from the group consisting of the oxides, sulfides and thermally decomposable compounds of molybdenum, tungsten, or mixture thereof wherein at least about 80% of the total molybdenum and tungsten content is in a valence state below 6, and heating said combination in an oxidizing atmosphere to a temperature above about 600°F for a period sufficient to oxidize said support modifier.

3,893,948

CATALYST OF REDUCING-DEHYDRATING TYPE FOR SYNTHESIZING VINYLAROMATIC COMPOUNDS AND METHOD OF PREPARING IT

Khachik Egorovich Khcheyan, prospekt Mira, 118a, kv. 190; Ninel Iosifovna Yakovich, ulitsa Fadeeva 6, kv. 108; Larisa Borisovna Kotelnikova, ulitsa Gertsena 10/5, kv. 28; Alexei Fedorovich Pavlichev, Nikitinskaya ulitsa 6, kv. 13, and Nina Nikolaevna Zhilnina, ulitsa Alimova, kv. 1, all of Moscow, U.S.S.R.

Filed May 21, 1973, Ser. No. 362,075

Int. Cl. B01j *11/82*

U.S. Cl. 252—440 6 Claims

1. A reduction-dehydration catalyst for the synthesis of vinylaromatic compounds consisting of 5–50 wt. percent of magnesium sulfate and 50–95 wt. percent of zinc oxide.

3. A reduction-dehydration catalyst for the synthesis of vinylaromatic carbonyl compounds from aromatic compounds consisting of 5–20 wt. percent of magnesium sulfate, 45–88 wt. percent of zinc oxide, and 2–45 wt. percent of magnesium oxide.

5. A reduction-dehydration catalyst for the synthesis of vinylaromatic compounds from aromatic carbonyl com-

pounds consisting of 10–20 wt. percent of magnesium sulfate, 80–90 wt. percent of zinc oxide, and 0.05–1 wt. percent of an alkali metal hydroxide based on the total catalyst weight.

3,893,949

CATALYSTS FOR USE IN CONVERSION OF GASES AND METHODS OF MANUFACTURING THEM

Toshiyuki Sakai, Funabashi; Kazuhide Miyazaki, Tokyo; Yutaka Ushimaru, Tokyo, and Michiaki Yamamoto, Tokyo, all of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed July 26, 1972, Ser. No. 275,325

Claims priority, application Japan, July 28, 1971, 46-55984; July 31, 1971, 46-57795

Int. Cl. B01j *29/00, 35/00*

U.S. Cl. 252—454 **19 Claims**

1. A method for manufacturing a catalyst composition for oxidizing a gas, which comprises

effecting an electroless plating of catalytic oxide selected from the group consisting of manganese oxide, copper oxide, iron oxide, chromium oxide, nickel oxide, cobalt oxide, bismuth oxide, zinc oxide, lead oxide, compounds containing at least one of said oxides and mixtures of said oxides by sensitizing same with an aqueous solution of stannous chloride, then activating same with an aqueous solution of a noble metal salt and then treating same with an electroless plating bath to deposit on the catalytic oxide from 0.1 to 10% by weight, based on the weight of catalytic oxide, of metal capable of promoting the catalytic effect of said catalytic oxide selected from the group consisting of Cu, Fe, Ni, Co, Cr, Sn and Ag.

3,893,950

METHOD FOR PREPARING A CATALYST FOR THE OXIDATIVE PURIFICATION OF EXHAUST GASES

Gerhard Mai, Bruchkobel, and Reiner Siepmann, Niederrodenbach, both of Germany, assignors to W. C. Heraeus GmbH, Hanau am Main, Germany

Continuation-in-part of Ser. No. 330,137, Feb. 6, 1973, abandoned. This application Nov. 23, 1973, Ser. No. 418,789

Claims priority, application Germany, Aug. 3, 1973, 2339338

Int. Cl. B01j *11/08*

U.S. Cl. 252—466 PT **4 Claims**

1. Method for preparing a catalyst for the oxidative purification of exhausts gases which comprises applying a suspension whose solid content consists essentially of boehmite to a ceramic suport body, followed by a first heat treatment at 100° to 300°C and a second heat treatment at 450° to 600°C, impregnating the so coated support body before or after the second heat treatment with an aqueous solution containing at least one salt of at least one metal of the platinum group and thereafter reducing the metal or metals of the platinum group to the metallic state by reduction with hydrogen.

3,893,951

CATALYSTS FOR OXIDATION REACTIONS

Robert K. Grasselli, Chagrin Falls, and Dev D. Suresh, Warrensville Hts., both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 228,375, Feb. 22, 1973, Pat. No. 3,840,595. This application Sept. 25, 1973, Ser. No. 400,468

Int. Cl. B01j *11/06, 11/22*

U.S. Cl. 252—468 **7 Claims**

1. A catalyst composition having the formula:

$A_a\ Sn_b\ W_c\ V_d\ Mo_e\ O_x$

wherein

A is one or more of the elements selected from Fe, Ni, Co, Zn, Mn, Cu and Mg;

and wherein

a is 0 to less than about 6;

b is a number greater than zero up to about 12;

c is a number of about 0.1 to about 6;

d is a number of about 0.5 to about 12;

e is a number of about 8 to about 16; and

x is the number of oxygens required to satisfy the valence requirements of the other elements present

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3,893,952

CATALYST CARRIER IN PARTICULAR FOR APPLIANCES FOR REMOVING CARBON MONOXIDE FROM EXHAUST GASES OF INTERNAL COMBUSTION ENGINES

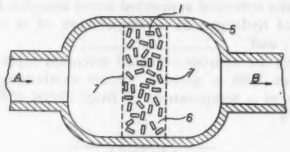
Josef Ryska, Ostrava; Jiri Frkal, Havirov; Eduard Kolos, Frydek-Mistek; Bretislav Panak, Ostrava; Lubomir Vagner, Ostrava, and Miroslav Pospisil, Ostrava, all of Czechoslovakia, assignors to Ostravsko-karvinske doly, oborove reditelstvi, Ostrava, Czechoslovakia

Filed Nov. 14, 1972, Ser. No. 306,205

Claims priority, application Czechoslovakia, Nov. 22, 1971, 8120/71

Int. Cl. B01j *11/40;* **F01n** *3/14;* **B01j** *11/46*

U.S. Cl. 252—477 R **6 Claims**



1. Catalyst carrier for use in an apparatus for the removal of carbon monoxide from the exhaust gases of internal combustion engines, said carrier consisting of a plurality of heat-resistant porous ceramic bodies having catalytic material deposited on all surfaces thereof and having catalyst material impregnating the pores of said bodies, each said body having a cylindrical shape and at least one axial internal through channel, the wall thickness of said body not exceeding the diameter of the axial through channel, said bodies being freely placed in said carrier.

3,893,953

3-OXABICYCLO[10.3.0]PENTADECENE-(6), ITS PREPARATION AND ITS USE AS A PERFUMING AGENT

Erich Klein, and Albrecht Roth, both of Holzminden, Germany, assignors to Dragoco Spezialfabrik Konz. Reich-und Aromastoffe Gerberding & Co. GmbH, Germany

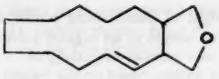
Division of Ser. No. 268,091, June 30, 1972, Pat. No. 3,824,258. This application Dec. 28, 1973, Ser. No. 429,651

Claims priority, application Germany, Feb. 28, 1972, 2209372

Int. Cl. A61k *7/00;* **C11b** *9/00*

U.S. Cl. 252—522 **1 Claim**

1. A perfume composition comprising an odor-imparting amount of 3-oxabicyclo[10.3.0]-pentadecene-(6) of the formula:



and at least one additional scenting agent.

3,893,954

DETERGENT COMPOSITIONS CONTAINING ENZYME AND CHLORINE SCAVENGER

Fred Tivin, Springfield Twp., Hamilton County, and Eugene Zeffren, Wyoming, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 76,994, Sept. 30, 1970, Pat. No. 3,755,085. This application June 5, 1973, Ser. No. 367,278

Int. Cl. C11d *1/42*

U.S. Cl. 252—548 **2 Claims**

1. A detergent composition comprising from about 1 – 99 percent by weight of an organic synthetic detergent, from about 1 – 99 percent by weight of an enzyme, and from about 0.001 – 5 percent by weight of a chlorine scavenger selected from the group consisting of tris(hydroxymethyl)-aminomethane, 2-amino-2-methyl-1,3-propanediol; 2-amino-2-ethyl-1,3-propanediol; 2-amino-1-butanol; 1-amino-2-propanol; 2-amino-1-propanol; and 2-amino-2-methyl-1-propanol.

3,893,955

AQUEOUS CONCENTRATE DETERGENT COMPONENT

Thomas Hewitt, Maryport; Douglas Edward Mather, Whitehaven, and Edward Tunstall Messenger, High Harrington, all of England, assignors to Albright & Wilson Limited, West Midlands, England

Filed Oct. 19, 1972, Ser. No. 298,989

Claims priority, application United Kingdom, Oct. 20, 1971, 48699/71; May 26, 1972, 25051/72

Int. Cl. C11d *1/12*

U.S. Cl. 252—551 **20 Claims**

1. An aqueous concentrate comprising 30–75% by weight of a sulphate of an alkoxylated aliphatic C_8-C_{24} alcohol and form 2 to 10% by weight of a water soluble salt of a carboxylic acid of the general formula

$A(COOH)_n$

wherein n is an integer of 1 to 4, and A is selected from the group consisting of hydrogen, a saturated aliphatic residue having from 1 to 8 carbon atoms, an unsaturated aliphatic residue of 2 to 8 carbon atoms, and when n is 2 the said formula also may be $(COOH)_2$.

18. A free-flowing aqueous concentrate comprising an admixture of

i. between 2 and 10% by weight of a water soluble salt of a carboxylic acid of general formula $A(COOH)_n$,

wherein n is an integer of 1 to 4, and A is selected from the group consisting of hydrogen, a saturated aliphatic residue of 1 to 8 carbon atoms, an unsaturated aliphatic residue of 2 to 8 carbon atoms, and when n is 2, the said formula also may be $(COOH)_2$; and

ii. an aqueous concentrate comprising between 30 and 75by weight of a sulphate of an alkoxylated aliphatic C_8-C_{24} alcohol which aqueous concentrate would be a thick paste or gel in the absence of admixture with component (i).

3,893,956

THIXOTROPIC COATING AGENTS BASED ON UREA ADDUCT OF POLYAMINE AND DIISOCYANATES

Dieter Brandt, Eschweiler, Germany, assignor to August Merckens Nachfolger Kommanditgesellschaft, Eschweiler, Germany

Filed Dec. 7, 1973, Ser. No. 422,951

Claims priority, application Austria, Dec. 11, 1972, 10493/72; Mar. 28, 1973, 2741/73

Int. Cl. C08g *22/00*

U.S. Cl. 260—18 TN **22 Claims**

1. A thixotropic coating agent comprising a binder and a thixotropizing agent, wherein the thixotropizing agent comprises a urea adduct obtained by reacting (a) a diisocyanate compound with (b) polyamine containing at least two amino groups which are primary or secondary amino groups, in the presence of the binder, using the diisocyanate compound in such quantities that, stoichiometrically, the amino groups do not outnumber the isocyanate groups to any appreciable extent.

3,893,957

FOAMED AND ORIENTED BLENDS OF LOW DENSITY POLYETHYLENE AND POLYPROPYLENE

Donald E. Mixon, and Dan F. Stewart, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 14, 1968, Ser. No. 752,502

Int. Cl. C08f *47/10*

U.S. Cl. 260—2.5 HA **11 Claims**

1. A foamed and oriented extrudate, the orientation of which has been effected by longitudinally stretching the same, composed essentially of approximately 5 to 20 weight percent of the composition of a low density polyethylene having a density in the approximate range of 0.914–0.925 and crystalline polypropylene said low density polyethylene being present in an amount such that the foamed and oriented extrudate will have increased opacity and improved sheen, flexibility and feel and when dye is contained therein a greater color intensity.

3,893,958

CATALYSTS FOR THE REACTION OF CYCLIC NITRILE COMPOUNDS WITH HYDROXYL GROUPS TO PRODUCE UREAS, URETHANES OR THIOURETHANES

Larry G. Wolgemuth, 100 E. Eagle Ln., Cherry Hill, N.J. 08003

Filed Dec. 21, 1973, Ser. No. 427,153

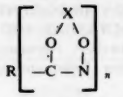
Int. Cl. C08g *22/44*

U.S. Cl. 260—18 TN **10 Claims**

1. In the method of preparing an organic compound having one or more urea, urethane or thiourethane groups obtained by condensing

a. A nucleophilic organic compound having at least one reactive hydrogen-containing radicai selected from the group consisting of primary amino radicals, secondary amino radicals, hydroxyl radicals, and mercapto radicals with

b. A cyclic nitrile compound having the structure



wherein X is

or

R is an organic radical which consists essentially of carbon and hydrogen and is free of reactive hydrogens as determined by the Zerewitinoff test and *n* is 1 to 4, the condensation which comprises catalyzing the condensation reaction by contacting said (a) and (b) with a catalytically-effective amount of

c. The catalyst combination of

1. A metal ion selected from the metals of Groups III through V of the Periodic Chart of the Elements, and
2. An alkali metal salt of a fatty acid.

3,893,959

ALKYL RESIN CONTAINING AN OLIGOMER MIXTURE OF UNSATURATED LONG CHAIN FATTY ACIDS

Ralph Earl Layman, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 409,223, Oct. 24, 1973, abandoned. This application Sept. 5, 1974, Ser. No. 503,218

Int. Cl. C09d *3/64, 5/02*

U.S. Cl. 260—22 D **10 Claims**

1. A hydrolytically stable alkyd resin which is capable of being rendered water dispersible comprising the esterification reaction product of

a. a mixture of (1) from about 40 to 82 percent of at least one aromatic dicarboxylic acid; (2) from about 5% to 20 percent of at least one aromatic tricarboxylic acid; (3) from about 10 to 20 percent of an oligomer mixture of unsaturated long chain fatty acids; and (4) from about 0 to 20 percent of at least one aliphatic dicarboxylic acid, wherein said percentages of acids are by weight based on the total weight of said acids used and total 100 percent, and

b. a mixture of (1) from about 90 to 50 percent of at least one hindered diol free of any carboxyl groups; (2) from about 0 to 25 percent of at least one hindered diol containing a tertiary carboxyl group; and (3) from about 0 to 25 percent of at least one unhindered diol or at least one polyhydric alcohol having at least three alcoholic hydroxy groups, wherein said percentages of diols and polyhydric alcohols are by weight based on the total weight of the alcohols used and total 100 percent.

3,893,960

ACRYLIC COATING COMPOSITION FOR FINISHING FLEXIBLE SUBSTRATES

Ronald J. Sheppard, Flushing, Mich., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

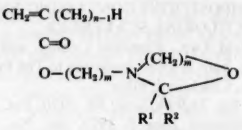
Division of Ser. No. 285,094, Aug. 30, 1972, Pat. No. 3,829,397. This application May 9, 1974, Ser. No. 468,482

Int. Cl. C08b *21/08;* **C08f** *37/18, 37/06, 45/38*

U.S. Cl. 260—23 AR **5 Claims**

1. A coating composition which comprises 40 to 60% by volume, based on the total volume of the coating composition of Composition I and correspondingly, 60 to 40% by volume, based on the total volume of the coating composition of Composition II; wherein Composition I consists essentially of 10–50% by weight of film-forming binder and correspondingly, 90–50% by weight of an organic solvent for the binder wherein the binder consists essentially of

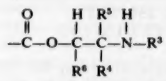
1. 35–65% by weight, based on the weight of the binder, of a copolymer consisting essentially of the reaction product of 80–90% by weight of methyl methacrylate and correspondingly, 10–20% by weight of an alkyl acrylate or an alkyl methacrylate having 2–12 carbon atoms in the alkyl groups;
2. 5–20% by weight, based on the weight of the binder, of a copolymer consisting essentially of the reaction product of 85–95% by weight of methyl methacrylate and 5–15% by weight of polymerized adhesion promoting monomer of the formula



wherein *n* is 1–2, *m* is 2–3 and R^1 and R^2 are selected from the group consisting of hydrogen, phenyl, benzyl, an alkyl group having 1–12 carbon atoms, or in combination are 2,2-spirocyclohexyl; and

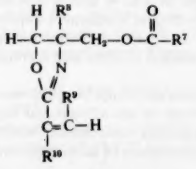
3. 30–50% by weight, based on the weight of the binder, of an organic plasticizer of a phthalate ester or an alkyd resin, and Composition II comprises a pigmented coating composition containing 0.1–20% by weight pigment and 10–50% by weight, based on the weight of the coating composition, of a film-forming binder which consists essentially of

1. 40–90% by weight, based on the weight of the binder, of a polymer consisting essentially of
   a. 75–90% by weight, based on the weight of the polymer, of methyl methacrylate,
   b. less than about 20% by weight, based on the weight of the polymer, of an alkyl acrylate or an alkyl methacrylate having 2–12 carbon atoms in the alkyl groups;
   c. 3–25% by weight, based on the weight of the polymer, of monovalent aminoester radicals attached to the backbone carbon atoms of the polymer backbone of the formula



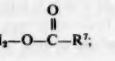
wherein R^3, R^4, R^5 and R^6 are hydrogen, benzyl or an alkyl radical having 1-4 atoms; and

2. 60–10% by weight, based on the weight of the binder, of a polymer which consists essentially of
   a. 30–70% by weight, based on the weight of the polymer, of methyl methacrylate,
   b. less than about 35% by weight of an ester of an alkyl acrylate or an alkyl methacrylate having 2–12 carbon atoms in the alkyl group,
   c. less than about 10% by weight of acrylonitrile,
   d. 15–35% by weight of a compound of the formula



wherein R^7 is a saturated hydrocarbon group of 3 – 21

carbon atoms or an unsaturated hydrocarbon group of 3 – 21 carbon atoms; R^8 is H, an alkyl group having 1 – 4 carbon atoms or



R^8 is H, an alkyl group having 1 – 4 carbon atoms; R^{10} is a saturated hydrocarbon group having 2 – 20 carbon atoms or an unsaturated hydrocarbon group having 2 – 20 carbon atoms.

3,893,961
TELEPHONE CABLE SPLICE CLOSURE FILLING COMPOSITION

Basil Vivian Edwin Walton, 54 Melrose Crescent, and William Edward John Wannamaker, 121 Avondale Rd., both of Belleville, Ontario, Canada

Filed Jan. 7, 1974, Ser. No. 431,161
Int. Cl. C08f *19/14, 21/04*
U.S. Cl. 260—23 H **31 Claims**

1. A composition suitable for use in filling splice closures in telecommunications cables, and the like, comprising:

a. from 85% – 98% by weight polybutene, said polybutene being in the form of a viscous, oily liquid having a viscosity within the range of about 200 to about 1750 Saybolt Universal seconds (SUS)/98.8℃; and

b. from about 0.25% to about 6.0%, by weight, of a gelling agent selected from the group consisting of hydrogenated castor oil and finely divided silica; said composition being a thixotropic, semi-solid, petrolatum-like material having a Brookfield viscosity at 98.8℃. (ASTM D 2669) within the range of about 125 to about 290 c.p.

3,893,962
TELEPHONE CABLE FILLING COMPOSITION (II)

Basil Vivian Edwin Walton, 54 Melrose Crescent, and William Edward John Wannamaker, 121 Avondale Rd., both of Belleville, Ontario, Canada

Filed Jan. 7, 1974, Ser. No. 431,160
Int. Cl. C08f *45/52*
U.S. Cl. 260—28.5 A **32 Claims**

1. A composition suitable for use in filling telecommunication cables and the like, comprising:

1. 50.0% - 65.0% poly(butene-1), of average molecular weight in the range of 500 - 3500;
2. 25.0% - 45.0% microcrystalline slackwax; or of an equivalent of said microcrystalline slackwax, said equivalent consisting essentially of a mixture of at least one microcrystalline wax with a high viscosity mineral oil meeting the following general specification:

Viscosity/98.8℃ — 120 SUS — 220 SUS
Viscosity/37.8℃. — 2000 SUS — 3500 SUS
Flash Point — 204.4℃ Minimum
Specific Gravity/15.6℃ — 01875 – 0.925
Colour ASTM 2 — ASTM 8
Boiling Range (at atmospheric pressure) – 260°–704.5℃;

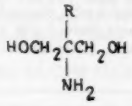
3. 1.0% – 8.0% polyethylene, of average molecular weight in the range of 10,000 to 20,000;
4. 1.0% – 10.0% of at least one wax selected from the group consisting of
   a. paraffin waxes having melting points in the range of 37.8° – 79.5℃., (b) synthetic Fischer-Tropsch type waxes having melting points in the range of 71.1° – 115℃., and (c) natural waxes selected from the group: Beeswax, Carnauba wax, Chinese insect wax, Japan wax, Myrtle wax and Spermaceti wax; and
5. from about 0.5% to about 8.0% finely divided silica, said percentages of ingredients being by weight, based on the entire composition.

3,893,963
COMPOSITION

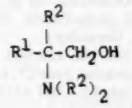
David K. Sausman, Terre Haute, Ind., assignor to Commercial Solvents Corporation, Terre Haute, Ind.

Filed Oct. 13, 1970, Ser. No. 80,480
Int. Cl.² C08L *61/20*
U.S. Cl. 260—29.4 R **8 Claims**

1. A pre-catalyzed aqueous urea-formaldehyde composition consisting of, by weight, 50–51% formaldehyde, 20–21% urea, water and about 0.5–1.5% of a latent catalyst mixture of the hydrochloride salt of an amino alkanediol corresponding to the formula



where R is methyl or ethyl, and an alkanolamine corresponding to the formula



where R^1 is hydrogen or alkyl of 1 or 2 carbon atoms, and R^2 is hydrogen or methyl in a mole ratio of about 1.5–2.0 of the amino alkanediol per mole of alkanolamine.

3,893,964
BINDER FOR FOUNDRY SAND

Hirotaka Kawai, Osaka; Hidetsugu Takenaka, Arita, and Osamu Yamamoto, Wakayama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Aug. 24, 1973, Ser. No. 391,267
Claims priority, application Japan, Aug. 30, 1972, 47-86848
Int. Cl. C08g *51/24*
U.S. Cl. 260—29.4 R **5 Claims**

1. A fluid, acid-hardening binder for foundry sand, consisting essentially of

A. from 2.5 to 55 percent by weight, based on the total weight of the binder, of the reaction product of a urea-glyoxal-formaldehyde composition, in which
   1. the total number of moles of aldehyde groups, per one mole of urea, is from 2 to 4,
   2. the percentage of glyoxal aldehyde groups of the total aldehyde groups is from 10 to 60%,
   3. the number of moles of glyoxal does not exceed the number of moles of urea, and
   4. the number of moles of formaldehyde does not exceed 2.5 times the number of moles of urea, said reaction product containing less than 5 wt. % of unreacted formaldehyde,

B. from 30 to 95 percent by weight, based on the total weight of the binder, of furfuryl alcohol, and

C. from 0 to 40 percent by weight, based on the total weight of the binder, of water.

3,893,965

COPOLYMERS OF SULFUR DIOXIDE WITH ALLYL GLYCEROL ETHERS

William Ross Moore, Lake Jackson, Tex., and Ralph Rolland Langner, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 274,583, July 24, 1972, abandoned, which is a continuation-in-part of Ser. No. 86,948, Nov. 4, 1970, abandoned. This application Feb. 4, 1974, Ser. No. 438,957

Int. Cl. C08f *45/34*

U.S. Cl. 260—29.6 H 6 Claims

1. A film prepared from the reaction of the copolymers of sulfur dioxide with a glycerol allyl ether selected from the group consisting of alpha allyl glycerol ether, beta allyl glycerol ether, and mixtures thereof with a member of the group consisting of glyoxal, paraformaldehdye, and mixtures thereof.

3,893,966

IMPACT-RESISTANT THERMOPLASTIC MOLDING MATERIAL

Dieter Stein, Limburgerhof; Franz Haaf, Ludwigshafen, and Karl-Heinz Illers, Otterstadt, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation of Ser. No. 126,944, March 22, 1971, abandoned. This application June 27, 1973, Ser. No. 373,979

Int. Cl. C08f *45/36*

U.S. Cl. 260—30.8 R 3 Claims

1. An impact-resistant thermoplastic molding material comprising:

A. from 5 to 100 parts by weight of a graft copolymer prepared by grafting from 10 to 95% by weight of a mixture of styrene and acrylonitrile in a ratio of 60 : 40 to 90 : 10 onto from 90 to 5% by weight of a polyacrylate rubber which contains at least 30% by weight of polymerized units of an alkyl acrylate having not more than eight carbon atoms in the alkyl radical;

B. from 0 to 95 parts by weight of a copolymer of styrene and acrylonitrile in a ratio of 60 : 40 to 90 : 10 with the proviso that (A) plus (B) contains at least 50% by weight of styrene and acrylonitrile; and

C. from 1 to 10 parts by weight, with reference to 100 parts by weight of (A) + (B), of an ester having the formula: $R^1—X—R^2$

where R^1 and R^2 each denotes an alkyl or aryl radical having four to twenty carbon atoms and X is either a —OOC— group or a —OOC—R^3—COO— group where R^3 denotes an alkylene or arylene grouping having 1 to 20 carbon atoms, the groupings R^1, R^2 and R^3 optionally also containing heteroatoms selected from the group consisting oxygen and sulfur and the sum of the carbon atoms in the ester molecule being at least 15.

3,893,967

COATING COMPOSITIONS AND PROCESS FOR THE PRODUCTION THEREOF

Paul Sunder-Plassmann, Marl; Klaus Gorke, Hullern, and Walter Dittmann, Marl, all of Germany, assignors to Chemische Werke Huels, A.G., Marl, Germany

Filed July 27, 1973, Ser. No. 383,254

Claims priority, application Germany, July 27, 1972, 2236842. The portion of the term of this patent subsequent to Nov. 6, 1990, has been disclaimed.

Int. Cl. C08g *33/10*

U.S. Cl. 260—32.8 A 17 Claims

1. A coating composition comprising a phenolic adduct of an unsaturated liquid polybutadiene wherein said adduct consists essentially of:

a. 62–70% by weight of a liquid polybutadiene having, prior to the adduct formation, a viscosity of 200 – 5,000 cp. at 20° C., a molecular weight of 500 – 4,000 as determined by vapor pressure osmosis, an iodine number of 400 – 470 g. iodine/100 g., and double bonds which are 50 – 95% in the 1,4-cis-configuration; and

b. correspondingly 38-25% by weight of phenol, 35–50% of which is joined to the polybutadiene as a phenyl ether and the remaining 65 – 50% of which is joined thereto ortho- and parato the phenolic hydroxy group; said adduct containing 5–35% of the olefinic double bonds of the liquid polybutadiene.

3,893,968

THERMOPLASTIC RESIN COMPOSITION HAVING HIGH IMPACT AND WEATHER RESISTANCE

Shujiro Shiga; Masayoshi Morimoto; Hideki Horiike; Mikio Hirai, and Yasuhiko Higashio, all of Ichihara, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Jan. 2, 1974, Ser. No. 429,915

Claims priority, application Japan, Jan. 6, 1973, 48-4875

Int. Cl. C08c *11/22, 11/30, 11/52*

U.S. Cl. 260—33.6 AQ 9 Claims

1. A thermoplastic resin composition having excellent resistance to weather and impact, which comprises

a binary or ternary graft-copolymer of 5 to 20 percent by weight of a rubber component consisting essentially of an ethylene-propylene rubber and 95 to 80 percent by weight of an aromatic vinyl compound or an aromatic vinyl compound and a vinyl cyanide compound, the ratio of the aromatic vinyl compound to the vinyl cyanide compound being 4:3 to 5:1;

0.5 to 10 percent by weight of liquid paraffin having a specific gravity of 0.860 to 0.905;

0.05 to 3 percent by weight of antioxidant, an ultraviolet absorber or both thereof, based on the weight of the resin composition, said ethylene-propylene rubber comprising ethylene and propylene in a molar ratio of 5:1 to 1:3 and selected from the group consisting of ethylene-propylene copolymer and ethylene-propylene terpolymer containing as a third component dicyclopentadiene, ethylidenenorbornene, 1,4-hexadiene, 1,5-hexadiene, 2-methyl-1,5-hexadiene, 1,4-cycloheptadiene, 1,5-cyclooctadiene or mixtures of these compounds and having an iodine number of 4 to 50.

3,893,969

REINFORCED POLYAMIDE MOLDING COMPOSITION

John Newbould, Sterling Heights, and Elio Eusebi, Troy, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 29, 1974, Ser. No. 456,182

Int. Cl. C08g *51/04*

U.S. Cl. 260—37 EP 3 Claims

1. A filled and reinforced polyamide composition comprising, by weight, 100 parts of a polyamide resin and from 5 to 220 parts of a finely divided filler dispersed therethrough, said filler being characterized by reactive surface hydroxyl groups, the particles of said filler being coated with the reaction product of from 0.1 percent to about 5 percent by weight, based on said filler, of an initially uncured, acetone soluble epoxy resin and an epoxy curing agent, said reaction product in said composition being chemically combined with the said filler particles by reaction with said hydroxyl groups.

3,893,970

FIRE RETARDANT POLYPROPYLENE COMPOSITIONS CONTAINING A HALOGENATED FLAME RETARDANT AND A PHOSPHITE ADJUVANT

John Versnel, Plainsboro, N.J., assignor to Cities Service Company, Tulsa, Okla.

Continuation-in-part of Ser. No. 185,832, Oct. 1, 1971, abandoned. This application Aug. 27, 1973, Ser. No. 391,901

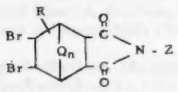
Int. Cl. C08f *45/54*; **C09k** *3/28*

U.S. Cl. 260—45.75 K **10 Claims**

1. A composition comprising:

A. polypropylene,

B. a primary flame retardant comprising a halogenated cyclic imide corresponding to the formula:

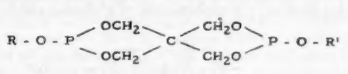


wherein Z is a hydrocarbon, chlorinated hydrocarbon, or brominated hydrocarbon radical, R is hydrogen or methyl, Q is methylene or oxygen, and *n* is an integer of 0–1, and

C. about 5–95%, based on the weight of the halogenated cyclic imide, of an organic phosphite flame retardant adjuvant containing 1–6 phosphorus atoms, 6–60 carbon atoms per phosphorus atom, and not more than one aromatic radical per phosphorus atom; said phosphite being selected from the group consisting of:

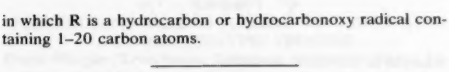
1. a phosphite corresponding to the formula P(QR)-(QR′)(QR″) in which Q is oxygen or sulfur, R and R′ are aliphatic or cycloaliphatic hydrocarbon radicals, and R″ is an aliphatic, cycloaliphatic, or aromatic hydrocarbon radical,

2. a phosphite corresponding to the formula:



in which R and R′ are hydrocarbon radicals containing 1–20 carbon atoms, and

3. a phosphite corresponding to the formula:



in which R is a hydrocarbon or hydrocarbonoxy radical containing 1–20 carbon atoms.

3,893,971

STABILIZED ETHYLENE-TETRAFLUOROETHYLENE COPOLYMER COMPOSITION

Hiroshi Ukihashi; Masaaki Yamabe, both of Tokyo; Hiromichi Nishimura, and Haruhisa Miyake, both of Yokohama, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Dec. 26, 1973, Ser. No. 428,414

Claims priority, application Japan, Dec. 25, 1972, 47-129387

Int. Cl. C08f *45/56*

U.S. Cl. 260—45.7 R **5 Claims**

1. An ethylene-tetrafluoroethylene copolymer composition having improved thermal stability, which comprises:

an admixture of an ethylene-tetrafluoroethylene copolymer, wherein the mold ratio of tetrafluoroethylene to ethylene is 40 – 70/60 – 30 and from 0.001 to 5 wt. % of α-alumina, based on the weight of the copolymer.

3,893,972

ACYL HYDRAZONES OF 2,2,6,6-TETRAMETHYLPIPERIDINE-4-ONES

Brian Holt, Royton; Donald Richard Randell, Stockport, and James Jack, Bramhall, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

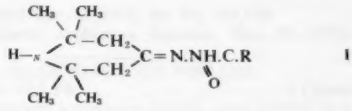
Division of Ser. No. 182,181, Sept. 20, 1971, Pat. No. 3,828,052. This application Jan. 25, 1974, Ser. No. 436,554

Claims priority, application United Kingdom, Sept. 19, 1970, 44760/70

Int. Cl. C08f *45/58*

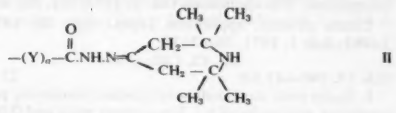
U.S. Cl. 260—45.8 N **14 Claims**

1. A composition comprising an organic material and from 0.01 to 5% by weight of a compound having the formula



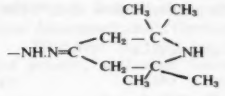
I

and their acid salts, wherein R represents hydrogen, a straight- or branched- alkyl residue having from 1 to 20 carbon atoms in which the alkyl chain may be uninterrupted or interrupted by one or more sulphur atom, a cycloalkyl residue having from 5 to 12 carbon atoms, a phenyl residue, a naphthyl residue, an arylalkyl residue containing from 7 to 14 carbon atoms or an alkylaryl residue having from 7 to 14 carbon atoms or R represents the grouping of formula



II

wherein Y is a divalent, straight- or branched chain alkylene residue having from 1 to 20 carbon atoms in which the alkylene chain is uninterrupted or interrupted by one or more sulfur atom, or an arylene residue having from 6 to 12 carbon atoms and *a* is 0 or 1, or R represents the grouping having the formula:



3,893,973

MANGANESE-(II)SALTS OF PHOSPHONIC ACID HALF-ESTERS, POLYAMIDE STABILIZERS

Jean Rody, Basel, and Paul Moser, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

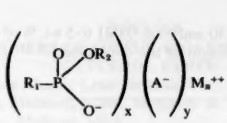
Division of Ser. No. 282,636, Aug. 21, 1972, Pat. No. 3,839,380. This application Feb. 7, 1974, Ser. No. 440,635

Claims priority, application Switzerland, Sept. 30, 1971, 14210/71

Int. Cl. C08g *51/62*

U.S. Cl. 260—45.75 R **16 Claims**

1. A composition containing a polyamide and a stabilizing amount of a compound of the formula I



(I)

wherein

R_1 is selected from the group consisting of alkyl with 1 to 18 carbon atoms, cyclohexyl, aryl with 6 to 10 carbon atoms which is unsubstituted or substituted by 1 or 2 methyl groups, and aralkyl with 7 to 11 carbon atoms;

A^- is selected from the group consisting of an anion of an aliphatic carboxylic acid with 1 to 18 carbon atoms, an anion of an aromatic carboxylic acid with 7 to 11 carbon atoms, and the chloride, bromide, and iodide anion;

x is 1 or 2,

y is 0 or 1, with x+y being 2, and

R_2 is alkyl with 1 to 18 carbon atoms.

3,893,974
EPOXY RESIN COMPOSITIONS CONTAINING AMINIMIDE COMPOUND

Hideki Niino, and Yo Marayama, both of Yokohama, Japan, assignors to Permachem Asia Co. Ltd., Tokyo, Japan

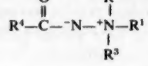
Continuation-in-part of Ser. No. 236,348, March 20, 1972, abandoned. This application Oct. 2, 1973, Ser. No. 402,839

Claims priority, application Japan, Apr. 20, 1971, 46-24982; July 1, 1971, 46-47637

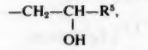
Int. Cl. C08g *30/14*

U.S. Cl. 260—47 EN **22 Claims**

1. Epoxy resin composition of excellent hardening property consisting essentially of a 1,2-polyepoxy resin and 0.002 to 8 parts by weight of an aminimide compound of the formula,

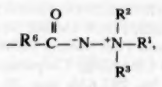


in which R^1 represents an alkyl radical or a residue,



R^2 and R^3 represent alkyl radicals,

R^4 represents an optionally substituted alkyl, aryl, aralkyl, cycloalkyl, alkoxy or allyloxy radical, or a vinyl radical, isopropenyl radical or a residue,



R^5 represents a hydrogen atom, or an alkyl, aryl, alkoxymethyl, aryloxymethyl, allyloxymethyl, hydroxyalkyl, methacryloyloxymethyl, or acryloyloxymethyl radical, and

R^6 represents an aliphatic, alicyclic, or aromatic hydrocarbon residue,

per 100 parts by weight of said epoxy resin.

3,893,975
HIGH MOLECULAR WEIGHT LINEAR POLYAMIDES FROM ARALIPHATIC DIAMINES

Geert Christoph; Eduard Radlmann, and Gunther Nischk, all of Dormagen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Bayerwerk, Germany

Continuation of Ser. No. 269,840, July 7, 1972, abandoned. This application Mar. 11, 1974, Ser. No. 450,209

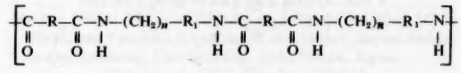
Claims priority, application Germany, July 9, 1971, 2134172

Int. Cl. C08g *20/20*

U.S. Cl. 260—47 CZ **5 Claims**

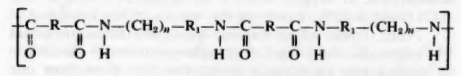
1. A high molecular weight linear copolyamide consisting essentially of:

a. recurring structural elements corresponding to the general formula



(I)

and

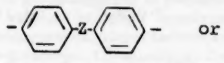


(II)

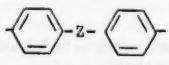
where:

R represents a linear or branched alkylene radical with 4 to 10 carbon atoms;

R_1 represents an unsubstituted radical selected from the group consisting of 1,3-phenylene, 1,4-phenylene, 1,4-naphthylene, 1,5-naphthylene, 4,4'-diphenylene, and



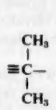
R_1 represents substituted radicals selected from the group consisting of 4,4'-diphenylene substituted one or more times by halogen or lower alkyl groups and a radical substituted one or more times by halogen or lower alkyl groups of the general formula



wherein in the above formulae

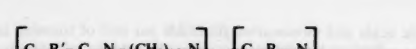
Z is a member selected from the group consisting of —O—,

—S—, $-CH_2-$, $-(CH_2)_2-$,

and 

n is an integer from 1 to 4; and

b. less than 90% by weight recurring structural elements corresponding to a general formula selected from the group consisting of


and mixtures

thereof wherein:

R′ represents a linear or branched alkylene radical with 4 to 10 carbon atoms; and

R_2 represents a linear or branched alkylene radical with 3 to 20 carbon atoms; said polyamide having a relative solution viscosity in the range from 1.1 to 4.0 as measured on a solution of 1 g of polyamide in 100 ml of n-cresol at 25°C.

3,893,976
POLYESTER RESINS

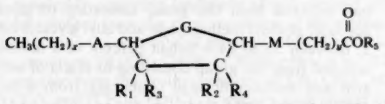
Robert F. Modler, and Stuart A. Harrison, both of Minneapolis, Minn., assignors to General Mills Chemicals, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 362,641, May 21, 1973, abandoned. This application Aug. 23, 1974, Ser. No. 499,817

Int. Cl. C08g *17/10*

U.S. Cl. 260—75 A **2 Claims**

1. A polyester having an inherent viscosity of about 0.4 to 1.0 measured in orthochlorophenol solvent, at a concentration of 0.5% by weight and at a temperature of 30°C. consisting essentially of the condensation product of 1,4-butanediol, terephthalic acid, isophthalic acid and a cyclical dicarboxylic acid having the structural formula



wherein x is 1 to 3, y is 5 to 8, and the sum of x and y is 6 to 11, R_1 and R_2 are H or CH_3 and at least one is H, and R_3 and R_4 are H, —COOH, $—COOCH_3$ or $—COOCH_2CH_3$ with the proviso that one of such radicals must be H and the other must be —COOH, $—COOCH_3$ or $—COOCH_2CH_3$ R_5 is —COOH, $—COOCH_3$ or $—COOCH_2CH_3$, A, G and M are selected from $—CH_2CH_2—$ and —CH=CH— groups with the proviso that A, G and M all can be $—CH_2—CH_2—$ groups and when G is —CH=CH—, A and M can be $—CH_2CH_2—$ or —CH=CH— but one must be $—CH_2CH_2—$ and the other —CH=CH—, wherein the 1,4-butanediol component and the total acid component are in an equivalent ratio of about 1:1 and the equivalent percent of the acids based upon the total acid equivalent are about 65 to 75 equivalent percent terephthalic acid, about 20 to 25 equivalent percent isophthalic acid and about 5 to 10 equivalent percent dicarboxylic acid having the above structural formula.

3,893,977
PULVERULENT BINDERS FOR THE ELECTROSTATIC POWDER-SPRAYING PROCESS

Frank Wingler, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 11, 1973, Ser. No. 359,579

Claims priority, application Germany, May 27, 1972, 2225958

Int. Cl. C08g *22/32*

U.S. Cl. 260—77.5 TB **3 Claims**

1. A pulverulent solvent free composition of matter suitable as a binder for powder lacquers comprising mixtures of

A. 40 to 98 parts by weight of copolymers with an average molecular weight of from 3,000 to 20,000 of

i. 20 to 60% by weight of styrene, α-methylstyrene, o-chlorostyrene, p-chlorostyrene, p-tert. butyl styrene or mixture thereof

ii. 30 to 65% by weight of acrylic acid alkyl ester with 1 to 12 carbon atoms in the alkyl radical and/or methacrylic acid alkyl ester with 2 to 12 carbon atoms in the alkyl radical;

iii. 0 to 30% by weight of methacrylic acid methyl ester and

iiii. 3 to 20% by weight of acrylic acid and/or methacrylic acid glycidyl ester;

B. 1 to 20 parts by weight of a polycarboxylic acid and/or polycarboxylic acid anhydride, and

C. 1 to 20 parts by weight of a blocked polyisocyanate.

3,893,978
PULVERULENT COATING AGENTS BASED ON BLOCKED AROMATIC DIISOCYANATES

Eckhard de Cleur, Duisburg; Rolf Dhein; Hans Rudolph, and Hans-Joachim Kreuder, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Bayerwerk, Germany

Filed Mar. 22, 1973, Ser. No. 343,798

Claims priority, application Germany, Mar. 28, 1972, 2215080

Int. Cl.² C08G *22/32*; **B05B** *5/00*

U.S. Cl. 260—77.5 TB **7 Claims**

1. A pulverulent solvent-free coating agent curable at a temperature of above 130°C. comprising

a. at least one polymer containing hydroxyl groups and having a softening temperature of at least 40°C. and

b. a crosslinking amount of an adduct of an aromatic diisocyanate, a dihydric alcohol, and ε-caprolactam, said dihydric alcohol being selected from the group consisting of ethylene glycol, propanediol, butanediol, hexanediol, diethyleneglycol, triethyleneglycol, thiodiglycol, N-methyldiethanolamine and mixtures thereof and said dihydric alcohol, diisocyanate and ε-caprolactam being present in said adduct in the molar ratio of 0.5–1: 2:2–3.

3,893,979
POLYETHERURETHANES WHICH CONTAIN HYDANTOIN RINGS AND THEIR USE AS ANTISTATIC AGENTS

Gerhard Dieter Wolf, Dormagen; Helmut Engelhard, Leverkusen, and Francis Bentz, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Sept. 14, 1973, Ser. No. 397,418

Claims priority, application Germany, Sept. 15, 1972, 2245345

Int. Cl. C08g *22/16*

U.S. Cl. 260—77.5 AQ **4 Claims**

1. Polyetherurethanes containing hydantoin rings corresponding to the general formula

$$X—(OC_nH_{2n})_p—(OC_mH_{2m})_q—Hyd—Y—Hyd—(C_mH_{2m}O)_q—(C_nH_{2n}O)_p—X$$

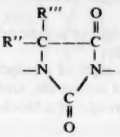
in which

Y represents a bivalent C_{2-18} hydrocarbon group or a bivalent C_2-C_8 hydrocarbon group substituted with halogen, alkyl, $—NO_2$ or —CN and

X represents the group

and

Hyd represents a bivalent group of the formula



in which

R represents a C_{1-18} alkyl, cycloalkyl, aryl, aralkyl, alkaryl group or such a group substituted with halogen, alkyl, $-NO_2$ or $-CN$,

R′ has the meanings defined for R or it represents the group $-(C_nH_{2n}O)_q-(C_nH_{2n}O)_p-X$,

R″ and R‴ represent a C_{1-4} alkyl or aryl group or together represent a C_{5-6} cycloalkyl group and

n and *m* represent an integer of from 2 to 6 and

p and *q* represent 0 or an integer of from 1 to 50, and at least *p* or *q* must be greater than 0.

3,893,980

POLY(AMINO ACID ALKYL ESTER PHOSPHAZENES)

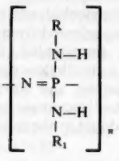
Harry R. Allcock; Karen M. Smeltz, and Daniel P. Mack, all of State College, Pa., assignors to Pennsylvania Research Corporation, University Park, Pa.

Filed Mar. 29, 1974, Ser. No. 456,351

Int. Cl. C08g *20/08*

U.S. Cl. 260—78 A **46 Claims**

1. An amino acid substituted polymer of the formula:



wherein:

A. R is $R_2CHCOOR_3$, R_2 being the residual group of an amino acid, and R_3 being alkyl containing up to five carbon atoms;

B. R_1 is R, as defined above, methylamino or ethylenimino; and

C. *n* is from about 500 to 20,000; the average number of methylamino groups per repeating unit, when present, being from about 0.25 to 1.75; the average number of ethylenimino groups per repeating unit, when present, being from about 0.0001 to 0.2.

3,893,981

PROCESS FOR THE PRODUCTION OF BASIC MODIFIED POLYAMIDES

Wilhelm Thoma, Berg Neukirchen; Dietrich Hildebrand, Odenthal; Wolf-Dieter Last, and Heinrich Rinke, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed July 6, 1973, Ser. No. 377,090

Claims priority, application Germany, July 8, 1972, 2233768; July 8, 1972, 2233703

Int. Cl. C08g *20/20, 20/12*

U.S. Cl. 260—78 L **8 Claims**

1. A process for the production of basic modified polyamides by the polycondensation of lactams or ω-aminocarboxylic acids in the presence of triamines of the formula

$H_2N-(CH_2)_n-NH-(CH_2)_n-NH_2$,

wherein n equals 2 to 6

dicarboxylic acids and monocarboxylic acids, which comprises adding to the reaction mixture 0.1 to 5.0 mol of the aliphatic triamine per 100 mol of the polycondensable lactam and 2 equivalents of carboxyl groups in the form of dicarboxylic acids and monocarboxylic acids per mol of triamine and the molar ratio of said monocarboxylic acids to said dicarboxylic acids being between 10 : 1 and 1 : 20.

3,893,982

PRESSURE-SENSITIVE ADHESIVE RESIN SOLUTIONS AND ARTICLES MANUFACTURED THEREFROM

Donald M. Gardner, Springfield, and Lawrence W. McKenna, Wilbraham, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 20, 1973, Ser. No. 333,916

Int. Cl. C08f *15/40*

U.S. Cl. 260—78.5 R **5 Claims**

1. An organic solvent solution which comprises:

A. an interpolymer comprising:

1. between 0.1 and 15 weight percent of an α, β-ethylenically unsaturated aliphatic carboxylic acid,
2. between 0.1 and 2 weight percent of a glycidyl monomer selected from the group consisting of glycidyl acrylate, glycidyl methacrylate and allyl glycidyl ether,
3. between 35 to 84.9 weight percent of a monomer selected from the group consisting of esters of acrylic acid and methacrylic acid containing from 6 to 20 carbon atoms, and
4. optionally, a monomer selected from the group consisting of α-olefins containing from 2 to 10 carbon atoms, vinyl esters of alkanoic acids containing from 3 to 10 carbon atoms, ethyl and methyl esters of acrylic and methacrylic acids, acrylonitrile, methacrylonitrile, styrene and vinyl chloride,

wherein the interpolymer has a weight average molecular weight in the range of 10,000 to 500,000 and a glass transition temperature in the range of −15° to −75°C.; and

B. 1,3-bis(dimethylamino)-2-hydroxypropane;

wherein there are between 0.01 and 1.0 parts by weight of the 1,3-bis(dimethylamino)-2-hydroxypropane per 100 parts by weight of interpolymer.

5. A pressure-sensitive permanently tacky resin which comprises:

A. an interpolymer comprising:

1. between 0.1 and 15 weight percent of an α, β-ethylenically unsaturated aliphatic carboxylic acid,
2. between 0.1 and 2 weight percent of a glycidyl monomer selected from the group consisting of glycidyl acrylate, glycidyl methacrylate, and allyl glycidyl ether,
3. between 35 to 84.9 weight percent of a monomer selected from the group consisting of esters of acrylic acid and methacrylic acid containing from 6 to 20 carbon atoms, and
4. optionally, a monomer selected from the group consisting of α-olefins containing from 2 to 10 carbon atoms, vinyl esters of alkanoic acids containing from 3 to 10 carbon atoms, ethyl and methyl esters of acrylic and methacrylic acids, acrylonitrile, methacrylonitrile, styrene, and vinyl chloride,

wherein the interpolymer has a weight average molecular weight in the range of 10,000 to 500,000 and a glass transition temperature in the range of −15° to −75°C.; and

B. 1,3-bis(dimethylmaino)-2-hydroxypropane; -bis(dimethylamino)-

wherein there are between 0.01 and 1.0 parts by weight of the 1,3-bis(dimethylamino)-2-hydroxypropane per 100 parts by weight of interpolymer.

3,893,983

PROCESS FOR OBTAINING MODIFIED DIENE POLYMERS

Aldo Brancaccio, Cremona; Giuseppe Ghetti, and Mario Bruzzone, both of San Donato Milanese, all of Italy, assignors to Snamprogetti S.p.A., San Donato Milanese, Italy

Filed Jan. 21, 1974, Ser. No. 435,082
Claims priority, application Italy, Feb. 2, 1973, 19946/73
Int. Cl. C08f *27/00*
U.S. Cl. 260—78.4 D 3 Claims

1. Process for obtaining modified polyisoprene having improved green strength consisting in feeding maleic acid and polyisoprene having a high cis 1,4 content and containing at least 3% imbibition water to a mixer-desiccator, at a temperature of from 140° to 200°C, and at a rate such that 0.01 to 5 parts by weight of maleic acid are fed per 100 parts of polyisoprene, whereby the reaction of the maleic acid with the polyisoprene and the desiccation thereof occur at the same time.

3,893,984

FLUORINE AND SULFUR-CONTAINING COMPOSITIONS

Robert Bonner Hager, Collegeville; Sameeh Said Toukan, Phoenixville, and Gerald Joseph Walter, King of Prussia, all of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 283,886, Aug. 25, 1972, abandoned. This application Apr. 8, 1974, Ser. No. 459,137
Int. Cl. C08f *3/84, 15/00, 19/00*
U.S. Cl. 260—79.7 5 Claims

1. A polymer consisting essentially of polymerized units of an ester selected from the class consisting of the methacrylic acid esters and the acrylic acid esters of a twin-tailed alcohol of the structure: $[R_f(CH_2)_nSCH_2]_2CHOH$ where n is 1-12 and R_f is selected from the group consisting of $CF_3(CF_2)_y$, $(CF_3)_2CF(CF_2)_y$ and $(CF_3)_2CFO(CF_2)_y$ where y is an integer of 1 to 14.

3,893,985

COPOLYMERS OF CYCLIC VINYL ETHERS AND CYCLIC ACETALS

Anthony Joseph Papa, Saint Albans, and William Robert Proops, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 146,843, May 25, 1971, Pat. No. 3,784,594. This application Aug. 29, 1973, Ser. No. 392,497
Int. Cl. C08f *15/00*
U.S. Cl. 260—80.3 R 12 Claims

1. A polymeric composition of matter which consists essentially of the reaction product formed by polymerization of: (1) a di-(3,4-dihydro-2H-pyranyl) compound with (2) a substituted 1,3-cyclic acetal in which the cyclic nucleus consists of from three to four carbon atoms in addition to the two oxygen atoms at the 1- and 3- positions thereof, at a mole ratio of (1):(2) of between about 0.2.1 and about 10:1.

3,893,986

PROCESS FOR THE PREPARATION OF NOVEL HYDROCARBON RESINS

Hisataka Komai; Atsuo Ishikawa, and Hideni Tsubaki, all of Kawasaki, Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

Filed Oct. 5, 1973, Ser. No. 404,023
Claims priority, application Japan, Oct. 12, 1972, 47-102154
Int. Cl. C08f *1/72*
U.S. Cl. 260—80.7 7 Claims

1. A process for the preparation of hydrocarbon solvent-soluble hydrocarbon resins, characterized by polymerizing a monomeric mixture comprising 35 – 85 percent by weight of 1,3-pentadiene, 5 – 30 percent by weight of cyclopentene and 10 – 50 percent by weight of diisobutylene, in the presence of a Friedel-Crafts type acidic metal halide catalyst.

3,893,987

MODIFIED HEXA FLUOROISOBUTYLENE/VINYLIDENE FLUORIDE COPOLYMERS HAVING IMPROVED PROCESSING CHARACTERISTICS

Swayambu Chandrasekaran, East Orange, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

Filed May 20, 1974, Ser. No. 471,512
Int. Cl. C08f *15/40*
U.S. Cl. 260—80.77 10 Claims

1. A solid copolymer of 3,3,3-trifluoro-2-trifluoromethyl propene, 1,1-difluoroethylene and perhalogenated comonomer selected from the group consisting of tetrafluoroethylene, chlorotrifluoroethylene and mixtures thereof, containing from about 5 to 52 mol percent of 3,3,3-trifluoro-2-trifluoromethyl propene, from about 30 to 90 mol percent of 1,1-difluoroethylene and from about 0.1 to 30 mol percent of perhalogenated comonomer.

3,893,988

COPOLYMERS OF ALKOXY AND HYDROXY ALKYL METHACRYLATES AND A PROCESS FOR THEIR PREPARATION

Donald Edwin Seymour, London, and Nicholas Mario Da Costa, Harlow, both of England, assignors to Hydron Limited, London, England

Division of Ser. No. 867,379, Oct. 17, 1969, Pat. No. 3,780,003. This application May 10, 1973, Ser. No. 359,045
Int. Cl. C08f *15/16*
U.S. Cl. 260—86.1 E 2 Claims

1. A copolymer prepared by copolymerizing in the presence of a free-radical initiator (a) 90 to 50 parts by volume of an alkoxy alkyl methacrylate selected from the group consisting of ethoxy ethyl methacrylate and methoxy ethyl methacrylate with (b) from 10 to 50 parts by volume of a hydroxy alkyl methacrylate selected from the group consisting of hydroxy ethyl methacrylate and hydroxy propyl methacrylate and optionally with a minor amount of a further monomer.

3,893,989

PROCESS FOR POLYMERIZING PROPYLENE

Giorgio Leicht, Terni, and Alberto Tanchi, Torre Orsina, both of Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Continuation of Ser. No. 165,844, July 6, 1971, abandoned. This application Oct. 9, 1973, Ser. No. 404,674
Int. Cl. C08f *1/42, 3/10*
U.S. Cl. 260—93.7 8 Claims

1. A method for preparing stereoregular propylene polymers having a high bulk density, comprising polymerizing propylene in the liquid phase at a temperature of from about 40° to 90°C in the presence of (1) a catalytic system which is the reaction product of:

a. violet crystalline titanium trichloride obtained by reducing titanium tetrachloride with an aluminum alkyl compound; and

b. an organic aluminum compound of the formula

$$AlR_3 \text{ or } AlR_2X,$$

wherein R is a hydrocarbon radical having from 2 to 6 carbon atoms and X is halogen,

and in the presence of (2) polypropylene prepared by low temperature polymerization of propylene in the liquid phase in the presence of the catalytic system as defined above, the low temperature being less than 40°C.

3,893,990

CLARIFICATION OF BLOOD SERUM AND PLASMA USING A BLOCK COPOLYMER OF ETHYLENE OXIDE AND POLYOXYPROPYLENE

Lajos F. Fekete, Costa Mesa, and Frank Peetoom, Laguna Beach, both of Calif., assignors to Baxter Laboratories, Inc., Morton Grove, Ill.

Continuation of Ser. No. 348,463, April 5, 1973, abandoned, which is a division of Ser. No. 158,111, June 29, 1971, Pat. No. 3,770,631. This application Apr. 1, 1974, Ser. No. 456,698

Int. Cl. C02b *1/20;* **C07g** *7/00*

U.S. Cl. 260—112 B **2 Claims**

1. The process in which a clarified plasma for use as a thromboplastin control is obtained from blood plasma by admixing said blood plasma with a compound of the formula

$$HO(CH_2CH_2O)_a\,(\underset{\displaystyle CH_3}{\underset{|}{C}}HCH_2O)_b\,(CH_2CH_2O)_cH$$

wherein a and c are integers such that the hydrophile portion represented by (CH_2CH_2O) constitutes at least about 50% of the molecule and b is an integer such that the hydrophobic portion represented by

$$(\underset{\displaystyle CH_3}{\underset{|}{C}}HCH_2O)$$

has a molecular weight of at least about 950 to a concentration of from greater than about 20 to about 30% on a weight per volume basis of said compound and at a pH of 6 to 7, admixing the resulting precipitate in normal physiological saline to 80 to 120% of the original volume of said blood plasma, admixing the resulting mixture with from about 0.5 to about 2% tribasic calcium phosphate at a pH of 7 to 7.4, removing the resulting precipitate and admixing the supernatant with aqueous buffer selected from the group consisting of (a) citrate-imidazole buffer comprising from about 0.0130 molar to 0.0140 molar trisodium citrate and about 0.025 to 0.035% imidazole and (b) oxalate-imidazole buffer comprising from about 0.0130 molar to 0.0140 molar sodium oxalate and about 0.025 to 0.035% imidazole, said buffers adjusted to pH 7.6 to 8.0.

3,893,991

CLARIFICATION OF BLOOD SERUM AND PLASMA USING BLOCK COPOLYMERS OF ETHYLENE OXIDE AND POLYOXYPROPYLENE

Lajos F. Fekete, Costa Mesa, and Frans Peetoom, Laguna Beach, both of Calif., assignors to Baxter Laboratories, Inc., Morton Grove, Ill.

Continuation of Ser. No. 348,438, April 5, 1973, abandoned, which is a division of Ser. No. 158,111, June 29, 1971, Pat. No. 3,770,631. This application Apr. 1, 1974, Ser. No. 456,697

Int. Cl. C02b *1/20;* **C07g** *7/00*

U.S. Cl. 260—112 B **2 Claims**

1. The process in which a clarified plasma for use as a thromboplastin control is obtained from blood plasma by admixing said blood plasma with a compound of the formula

$$HO(CH_2CH_2O)_a\,(\underset{\displaystyle CH_3}{\underset{|}{C}}HCH_2O)_b\,(CH_2CH_2O)_cH$$

wherein a and c are integers such that the hydrophile portion represented by (CH_2CH_2O) constitutes at least about 50% of the molecule and b is an integer such that the hydrophobic portion represented by

$$(\underset{\displaystyle CH_3}{\underset{|}{C}}HCH_2O)$$

has a molecular weight of at least about 950 to a concentration of from greater than 20 to about 30% on a weight per volume basis of said compound and at a pH of 6 to 7, admixing the resulting precipitate in aqueous buffer to 50 to 70% of the original volume of said blood plasma, said buffer selected from the group consisting of (a) citrate-imidazole-normal saline buffer comprising about 0.9% to NaCl solution, about 0.0130 molar to 0.0140 molar tri-sodium citrate and about 0.025 to 0.035% imidazole and (b) oxalate-imidazole-normal saline buffer comprising about 0.9% NaCl solution, about 0.0130 molar to 0.0140 molar sodium oxalate and about 0.025 to 0.035% imidazole, said buffers adjusted to pH 7.0 to 7.4.

3,893,992

N-ACYLATED PEPTIDES OF AMINO AROMATIC SULFONIC ACIDS AND THEIR DERIVATIVES

Peter L. De Benneville, Philadelphia, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 91,176, Nov. 19, 1970, Pat. No. 3,801,562. This application Dec. 12, 1973, Ser. No. 424,020

Int. Cl. C07c *103/52, 143/78, 143/56*

U.S. Cl. 260—112.5 **11 Claims**

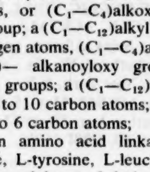
1. A compound of the formula

$$RCO—A_n—NHR'CO—B_m—NHZ$$

wherein R is a hydrogen atom; a phenyl group; a phenyl group substituted with one or more halogen atoms, $(C_1—C_4)$alkyl groups, hydroxy groups, $(C_1—C_4)$alkoxy groups, $(C_1—C_4)$alkanoyloxy groups, or $(C_1—C_4)$alkoxycarbonyl groups; a $(C_1—C_{12})$alkyl group; a $(C_1—C_{12})$alkyl group substituted with one or more halogen atoms, $(C_1—C_4)$alkoxy groups, hydroxy groups, $(C_1—C_4)$— alkanoyloxy groups, polyalkoxyalkyl groups, or phenyl groups; a $(C_1—C_{12})$alkoxy group; an aralkoxy group of up to 10 carbon atoms; or a divalent alkylene group having up to 6 carbon atoms;

NHR'CO is an amino acid linkage derived from L-phenylalanine, L-tyrosine, L-leucine; L-methionine, L-tryptophan, L-arginine, or L-lysine;

Z is a group of the formula



wherein

R'' is a hydroxy group, a $(C_1—C_4)$alkoxy group, a $(C_1—C_4)$alkoxyalkoxy group, an amino group, a $(C_1—C_4)$monoalkylamino group, a $(C_1—C_4)$dialkylamino group, a group of the formula $—NHCH_2COR''$, or a salt of the group in which R'' is a hydroxy group;

X is a hydroxy group, a $(C_1—C_4)$alkyl group, a halogen atom, or a $(C_1—C_4)$alkoxy group; and

n' is 0, 1, or 2;

A and B are the residues of low molecular weight amino acids selected from the group consisting of glycyl, alanyl, and glycylglycyl; and

m and *n* are 0, 1, or 2.

3,893,993

ALLERGENIC EXTRACTS CROSS LINKED UNDER ACID CONDITIONS WITH INORGANIC CYANATES

Noel Austin Mullan, and Brian George Overell, both of Dorking, England, assignors to Beecham Group Limited, Great Britain

Division of Ser. No. 59,745, July 30, 1970, Pat. No. 3,794,630. This application July 20, 1973, Ser. No. 381,342

Claims priority, application United Kingdom, Aug. 6, 1969, 39289/69; May 15, 1970, 23621/70; May 16, 1970, 23853/70

Int. Cl. C07g *7/00*

U.S. Cl. 260—112 R **16 Claims**

1. A process for the preparation of a modified allergenic material which comprises an allergenic extract of pollen or house dust which consists principally of a protein or glycoprotein, which allergenic extract is crosslinked under acidic conditions inter- or intra-molecularly with an inorganic cyanate, said modified allergenic material being substantially water-insoluble or only sparingly water-soluble and having a reduced allergenicity relative to the uncrosslinked protein or glycoprotein and having the ability to stimulate the production of antibodies having cross-specificity for the unlinked protein or glycoprotein, which comprises reacting an allergenic extract of a pollen extract selected from the group consisting of Cocksfoot pollen, mixed grass pollens and timothy pollen or house dust with an inorganic cyanate at an acidic pH to reduce the allergenicity and recovering the modified allergenic material so produced.

3,893,994

4-(ALKYL)-4'-(ALKOXY OR ALKYLCARBONYLOXY)-1,1'-AZOBENE

Ralf Steinstrasser, Darmstadt-Eberstadt, Germany, assignor to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

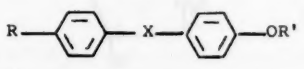
Continuation-in-part of Ser. No. 91,522, Nov. 20, 1970, Pat. No. 3,773,747. This application July 27, 1973, Ser. No. 383,253

Claims priority, application Germany, Mar. 28, 1970, 2014989

Int. Cl. C07c *107/06*; **C09k** *3/02*

U.S. Cl. 260—206 **14 Claims**

1. A compound of the formula



wherein X is azo, R is straight-chain alkyl of 3–8 carbon atoms and R' is straight-chain alkyl of 1–10 carbon atoms or straight-chain alkanoyl of 2–10 carbon atoms.

3,893,995

METHOD FOR OBTAINING POLYFRUCTOSANS

Ernst Nitsch, and Siegried Muhlbock, both of Linz, Austria, assignors to Laevosan-Gesellschaft mbH & Co. KG, Linz, Austria

Filed Dec. 6, 1971, Ser. No. 205,293

Claims priority, application Austria, Dec. 9, 1970, 11055/70

Int. Cl. C07g *3/00*

U.S. Cl. 260—209 R **7 Claims**

1. A method for obtaining the highly water-soluble polyfructosans from the storage organs of monocotyledon plants, which comprises;

a. extracting said polyfructosan with a member selected from the group consisting of a low alcohol and acetone having a water content of from 80–40 percent,

b. bringing said extract to a pH of about 9 with calcium hydroxide,

c. filtering and concentrating said extract into a thick syrup under reduced pressure,

d. adding to said extract, in an amount equal to about half of said extract's weight, a low alcohol,

e. acidifying said extract with a strong acid, to obtain a pH of between 1 and 3,

f. subsequently precipitating the polyfructosan with a member selected from the goup consisting of a low alcohol and acetone, in an amount of 2 to 8 times the weight of said extract, and

g. converting the precipitate thus formed into a powdery crystalline state by repeatedly kneading the same with a water-free precipitation agent.

3,893,996

HYDROXYALKYL AND MERCAPTOALKYL DERIVATIVES OF β-(1 → 3) GLUCANS

Junji Hamuro, Tokyo, and Masao Akiyama, Kawasaki, both of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Aug. 2, 1973, Ser. No. 385,173

Claims priority, application Japan, Aug. 7, 1972, 47-78992

Int. Cl. C07c *47/18*

U.S. Cl. 260—290 R **7 Claims**

1. A water-soluble hydroxyalkyl glucan or mercaptoalkyl glucan having a glucan moiety essentially consisting of glucose units connected by β-(1 3) bonds and 0.02 to 1.2 hydroxyalkyl or mercaptoalkyl moieties per glucose unit, said hydroxyalkyl or mercaptoalkyl having 2 to 4 carbon atoms, said compound having a molecular weight of more than 10,000.

3,893,997

PSEUDODISACCHARIDE INTERMEDIATES

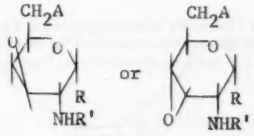
David J. Cooper, Downingtown, Pa., and Jerry A. Weisbach, Cherry Hill, N.J., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed July 1, 1974, Ser. No. 484,495

Int. Cl.² C07C *47/18*

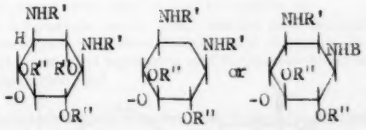
U.S. Cl. 260—210 R **12 Claims**

1. A compound of the formula



wherein

R is



R' is an amino protecting group or hydrogen;

A is OR'', NHR', or NYR';

Y is lower alkyl of 1 to 4 carbon atoms,

R'' is a hydroxy protecting group or hydrogen; and

B is —COCHOR''CH_2CH_2NHR';

3,893,998

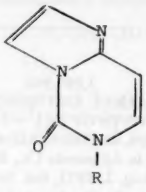
FLUORESCENT DERIVATIVES OF CYTOSINE-CONTAINING COMPOUNDS

John A. Secrist, III, Cambridge, Mass.; Jorge R. Barrio; Nelson J. Leonard, both of Urbana, and Laurence G. Dammann, Champaign, all of Ill., assignors to University of Illinois Foundation, Urbana, Ill.

Filed Feb. 22, 1973, Ser. No. 334,674
Int. Cl. C07d *51/52*
U.S. Cl. 260—211.5 R **8 Claims**

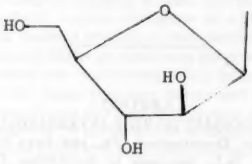
1. A biologically active fluorescent coenzyme selected from the group consisting of:

A. compounds having the formula

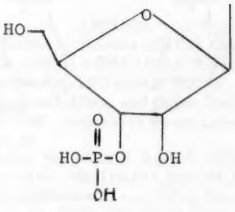


wherein R has any of the following formulas:

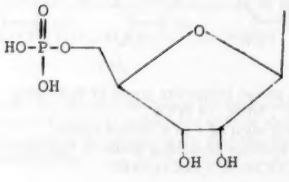
(1)



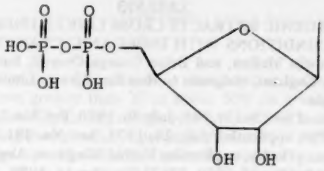
(2)



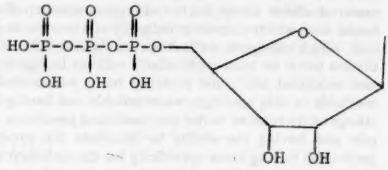
(3)



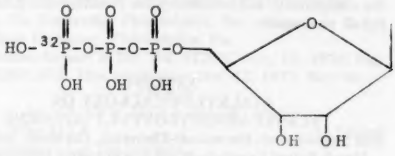
(4)



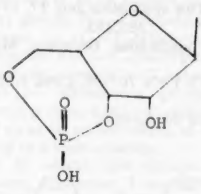
(5)



(6)



(7)



B. anhydrides of A(3) above with nicotinamide mononucleotide or flavin mononucleotide; and

C. salts of any of the compounds of Groups A(2)–A(7) or (B) above with inorganic bases.

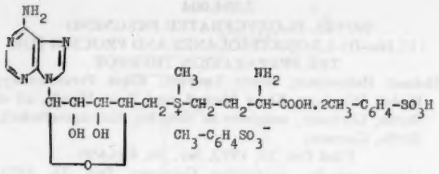
3,893,999

SALT OF S-ADENOSIL-L-METHIONINE AND PROCESS OF PREPARATION

Alberto Fiecchi, Milan, Italy, assignor to Bioresearch S.a.s., Milan, Italy

Filed July 17, 1973, Ser. No. 380,097
Claims priority, application Italy, Aug. 2, 1972, 27793/72
Int. Cl. C07d *51/54*
U.S. Cl. 260—211.5 R **18 Claims**

1. The tri-p-toluenesulphonate of S-adenosil-L-methionine of formula



wherein R' is a radical selected from the group consisting of aliphatic of from 1 to 20 carbon atoms, aromatic of from 6 through 10 carbon atoms, and araliphatic of from 7 through 12 carbon atoms,

and Z is selected from thr group consisting of Y and hydrogen; and pharmaceutically acceptable acid additon salts thereof.

3,894,000

ARA-CYTIDINE DERIVATIVES AND PROCESS OF PREPARATION

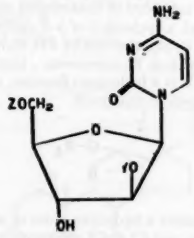
William J. Wechter, and Donald T. Warner, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 110,312, Jan. 27, 1971, abandoned. This application July 19, 1973, Ser. No. 380,850

Int. Cl. C07d *51/52*

U.S. Cl. 260—211.5 R **45 Claims**

1. A compound of the formula



I, II

wherein Y is selected from the group consisting of 1.

wherein R is a radical selected from the group consisting of aliphatic of from 1 through 20 carbon atoms, aromatic of from 6 through 10 carbon atoms, cage-type hydrocarbon of from 7 through 20 carbon atoms, monocyclic aliphatic of from 4 through 10 carbon atoms, araliphatic of from 7 through 12 carbon atoms and monocyclic heterocyclic of from 4 through 10 carbon atoms, including such radicals substituted by halogen, hydroxyl, carboxyl, nitro, alkoxyl or mercapto groups, and

2.

wherein R' is a radical selected from the group consisting of aliphatic of from 1 to 20 carbon atoms, aromatic of from 6 through 10 carbon atoms, and araliphatic of from 7 through 12 carbon atoms,

and Z is selected from thr group consisting of Y and hydrogen; and pharmaceutically acceptable acid additon salts thereof.

3,894,001

11-AMINOALKYL- AND 11-CYCLICAMINOMORPHANTHRIDINES

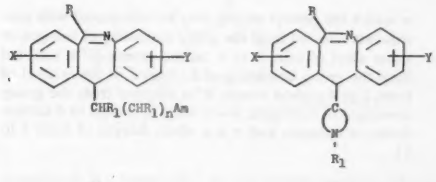
Alexander E. Drukker, Milwaukee, Wis., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 848,355, Aug. 7, 1969, Pat. No. 3,699,099, and a continuation-in-part of Ser. No. 48,506, June 22, 1970, abandoned. This application Nov. 20, 1972, Ser. No. 307,933

Int. Cl. C07d *41/08*

U.S. Cl. 260—239 D **10 Claims**

1. A compound selected from compounds of the formulae:



I II

in which X and Y are hydrogen, halo, alkoxy of 1 to 3 carbons, alkyl of 1 to 4 carbons, thio-lower alkyl or trifluoromethyl, n is 0 to 4, R, R_1 and R_2 are hydrogen or alkyl of 1 to 4 carbon atoms, Am is

a.

in which R_3 and R_4 are hydrogen, alkyl of 1 to 4 carbons or phenyl-lower alkyl of 7 to 13 carbons, or

b. a heterocyclic amino group selected from morpholino, pyrrolidino, piperidino, N-lower alkyl piperazino, N-phenyl-lower alkyl piperazino and N-(hydroxy-lower alkyl) -piperazino, and

-C N-

is a cyclicamino group selected from 3-piperidyl, 4-piperidyl, 3-pyrrolidyl, 3-homopiperidyl and 4-homopiperidyl and pharmaceutically acceptable acid addition salts thereof.

10. A compound of Formula II of claim 1 in which X and Y are hydrogen or chloro,

-C N-

is 3 or 4-piperidyl and R_1 is an alkyl of 1 to 4 carbons.

3,894,002

SUBSTITUTED NAPHTHYLALKYLENE LACTAMIMIDES

Robert D. MacKenzie; Thomas R. Blohm, and Edward M. Roberts, all of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

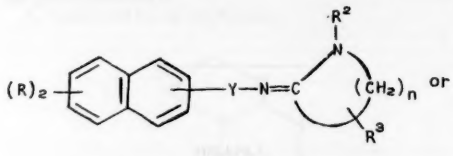
Continuation-in-part of Ser. No. 143,258, May 13, 1971, abandoned. This application Aug. 9, 1973, Ser. No. 386,997

Int. Cl. C07d *27/04, 29/28, 41/08*

U.S. Cl. 260—239 B 13 Claims

1. A compound selected from

A. a compound of the formula



or

B. a pharmaceutically acceptable acid addition salt thereof, wherein each R is selected from the group consisting of hydrogen, halogen, trifluoromethyl, alkyl of from 1 to 12 carbon atoms, alkoxy of from 1 to 3 carbon atoms or nitro; Y is an alkylene chain of from 1 to 6 carbon atoms or

in which the phenyl moiety may be substituted with substituents selected from the group consisting of halogen or lower alkyl of from 1 to 3 carbon atoms; R^2 is selected from the group consisting of hydrogen or lower alkyl of from 1 to 4 carbon atoms; R^3 is selected from the group consisting of hydrogen, lower alkyl of from 1 to 4 carbon atoms or halogen; and n is a whole integer of from 3 to 11.

3,894,003

4-BIPHENYLCARBONYLACYLAMIDO PENICILLANIC ACID AND SALTS

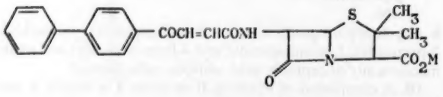
Peter H. L. Wei, Springfield, and Ronald J. McCaully, Malvern, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Mar. 18, 1974, Ser. No. 452,016

Int. Cl.[2] C07D *499/44*

U.S. Cl. 260—239.1 2 Claims

1. A compound of the formula:



in which M is a member selected from the group consisting of -H, an alkali metal and $-NH_4$.

3,894,004

NOVEL 11-OXYGENATED PREGNENO (17,16α-D)-1,3-OXATHIOLANES AND PROCESS FOR THE PREPARATION THEREOF

Helmut Hofmeister; Henry Laurent; Klaus Prezewowsky; Rudolf Wiechert; Klaus Mengel, and Hans Wendt, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

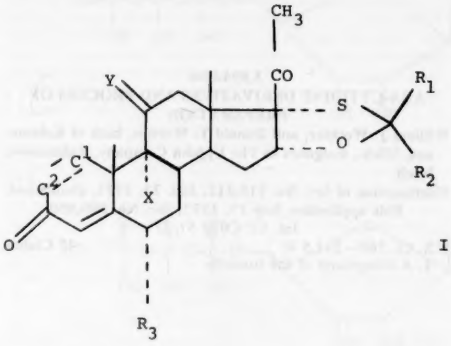
Filed Dec. 20, 1973, Ser. No. 426,600

Claims priority, application Germany, Dec. 22, 1972, 2264001

Int. Cl.[2] C07C *173/00*

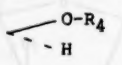
U.S. Cl. 260—239.5 14 Claims

1. 11-oxygenated pregneno [17,16α-d]-1′,3′-oxathiolanes of the Formula I



I

wherein R_1 and R_2, can be the same or different and are a hydrogen atom, a saturated or unsaturated alkyl of 1–5 carbon atoms, a cycloalkyl, a cycloalkyl of 3–8 carbon atoms, phenyl, or thienyl; R_1 and R_2 together can be a $(CH_2)_n$) bridge wherein n has the values of 2–6; R_3 represents a hydrogen or fluorine atom, or methyl; X is a hydrogen, fluorine, or chlorine atom; Y is an oxygen atom or the group



wherein R_4 represents a hydrogen atom or an alkanoyloxy of 1–4 carbon atoms; and $C^1 \cdots C^2$ represents a single or double bond between the C-1 and C-2 carbon atoms.

3,894,005

HYDRAZONES OF PYRAZOLO[3,4-B]PYRIDINES

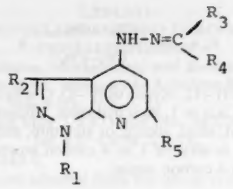
Hans Hoehn, Tegernheim, and Ernst Schulze, Regensburg, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 24, 1974, Ser. No. 473,122

Int. Cl. C07d *31/42, 39/00*

U.S. Cl. 260—240 G 12 Claims

1. A compound of the formula



wherein R_1 is lower alkyl or phenyl-lower alkyl; R_2 is hydrogen or lower alkyl, R_3 is lower alkyl, phenyl or substituted phenyl; R_4 is hydrogen, lower alkyl, phenyl or substituted phenyl, said phenyl substituents being halogen, lower alkyl or carboxy; or R_3 and R_4 together complete a C_3 to C_6 cycloalkyl ring; and R_5 is hydrogen, lower alkyl or phenyl; and physiologically acceptable acid addition salts thereof.

3,894,006

PROCESS FOR MANUFACTURE OF β-(3-OXC-7 α-THIOACYL-17β-HYDROXY-4-ANDROSTENE-17α-YL) PROPIONIC ACID γ-LACTONES

Ulrich Stache, Hofheim, Taunus, and Kurt Radscheit, Kelkheim, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

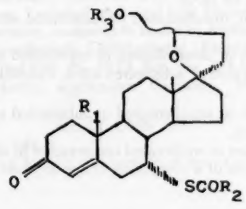
Filed Oct. 3, 1973, Ser. No. 403,018

Claims priority, application Germany, Oct. 5, 1972, 2248835

Int. Cl. C07c *173/00*

U.S. Cl. 260—239.55 R **9 Claims**

1. A compound of the formula



in which R_1 stands for the methyl group or a hydrogen atom and R_2 and R_3 each stand for an alkyl group having 1 to 5 carbon atoms.

3,894,007

2-[(2,4-DIOXO-1-IMIDAZOLIDINYL)IMINO]ETHYL-P-CHLOROBENZOATE

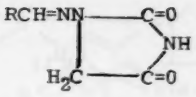
Ralph L. White, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Jan. 25, 1974, Ser. No. 436,465

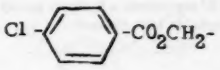
Int. Cl. C07d *49/32*

U.S. Cl. 260—240 G **3 Claims**

1. A compound of the formula:



wherein R is $ClCH_2$- or



3,894,008

2-IMIDAZOLIN-5-ONES

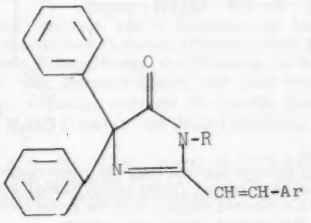
John L. Irvine, West Allis, Wis., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed May 31, 1974, Ser. No. 475,049

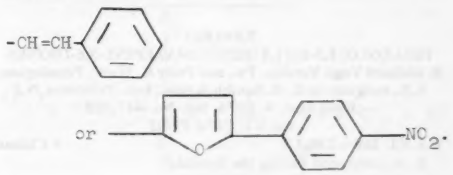
Int. Cl. C07d *5/04, 49/36*

U.S. Cl. 260—240 A **9 Claims**

1. A compound of the formula



in which R is a lower alkyl of 1 to 4 carbon atoms, phenyl, halo-substituted phenyl or tolyl, and Ar is phenyl, halo-substituted phenyl, pyridyl,



3,894,009

PROSTAGLANDIN DERIVATIVES AND PROCESS FOR THE PREPARATION THEREOF

Kiyoshi Sakai; Takashi Yusa; Shigeo Amemiya; Masaaki Ito; Hamako Katano; Mitsuo Yamazaki; Mitsuko Sugiura; Koichi Kojima, and Masaaki Sasaki, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

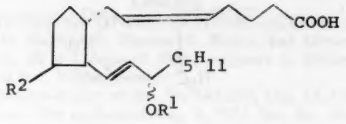
Continuation-in-part of Ser. No. 292,513, Sept. 27, 1972, abandoned. This application Dec. 4, 1973, Ser. No. 421,601

Claims priority, application Japan, July 5, 1972, 47-67342

Int. Cl. C07c *61/32*

U.S. Cl. 260—240 R **4 Claims**

1. A 11,15-dihydroxyprosta-5(cis),13(trans)-dienoic acid having the formula



wherein R^1 represents a hydrogen atom or a 2-tetrahydropyranyl group and R^2 represents a hydroxy group and the pharmaceutically acceptable salts thereof.

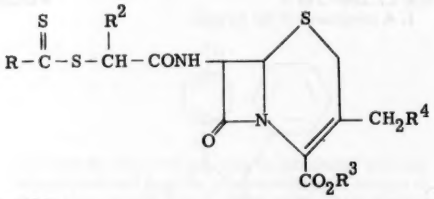
3,894,010

3-[2-(THIOACYLTHIO)ALKANAMIDO]-1,4-[CYCLO(1'-ARBOXY)-ALKYLENETHIO]AZETIDIN-2-ONE DERIVATIVES AND THEIR PREPARATION

Daniel M. Teller, Devon, and John H. Sellstedt, King of Prussia, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Apr. 16, 1973, Ser. No. 351,662
Int. Cl. C07d *99/16, 99/24*
U.S. Cl. 260—243 C **8 Claims**

1. A compound of the formula:



in which

R is a member selected from the group consisting of (lower)-alkyl, phenyl, (lower alkoxy)phenyl, and 2-thienyl;
R^2 is a member selected from the group consisting of —H, (lower)alkyl, phenyl and carboxy;
R^3 is a member selected from the group consisting of —H and an alkali metal cation; and
R^4 is a member selected from the group consisting of —H, (lower)alkanoyloxy and N-pyridinium.

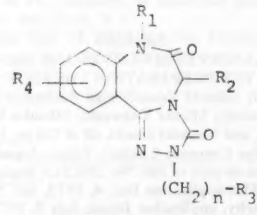
3,894,011

TRIAZOLO[4,3-D][1,4]BENZODIAZEPINE-3,6-DIONES

B. Richard Vogt, Yardley, Pa., and Peter C. Wade, Pennington, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 4, 1974, Ser. No. 447,625
Int. Cl. C07d *57/02*
U.S. Cl. 260—239.3 T **4 Claims**

1. A compound having the formula



or a pharmaceutically acceptable acid-addition salt thereof, wherein R_1 is hydrogen, alkyl, phenyl or benzyl; R_2 is hydrogen or alkyl;

wherein A is CH—Q, oxygen or N—Q, Q is hydrogen, alkyl or phenyl, and m is 0 or 1; R_4 is hydrogen, halogen, nitro, cyano, trifluoromethyl, alkyl, alkoxy, or alkylthio; and *n* is 2, 3, or 4; wherein alkyl is alkyl of 1 to 4 carbon atoms and alkoxy is alkoxy of 1 to 4 carbon atoms.

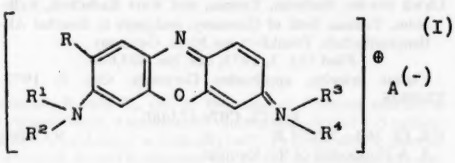
3,894,012

PRODUCTION OF OXAZINE DYE

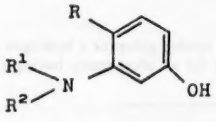
Hans Baumann, Ludwigshafen, and Udo Mayer, Frankenthal, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Feb. 7, 1973, Ser. No. 330,253
Claims priority, application Germany, Feb. 11, 1972, 2206508
Int. Cl. C09b *19/00*
U.S. Cl. 260—244 R **2 Claims**

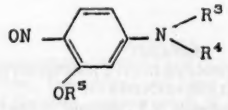
1. In the process for the production of an oxazine dye of the formula (I):



R is hydrogen or alkyl;
R^1 is hydrogen, unsubstituted or substituted alkyl, cycloalkyl or aralkyl;
R^2 is hydrogen or unsubstituted or substituted alkyl;
R^3 is unsubstituted or substituted alkyl, cycloalkyl, aralkyl or phenyl;
R^4 is hydrogen or unsubstituted or substituted alkyl; and
$A^{(-)}$ is an anion,
by condensation at an elevated temperature in an alcoholic or glycolic solution of a compound of the formula



and a compound of the formula



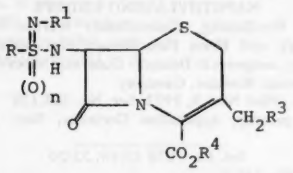
where R^5 is alkyl of one to four carbon atoms and R to R^4 have the meanings given above, the improvement which comprises carrying out the condensation in the presence of both a zinc salt as a Lewis acid and a basic zinc compound as a base.

3,894,013
SULFIN AND SULFONAMIDINO DERIVATIVES OF CEPHALOSPORINS.

Abraham Nudelman, Montgomery, and Ronald J. McCaully, Chester, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed May 7, 1973, Ser. No. 357,761
Int. Cl.[2] C07D *501/16*
U.S. Cl. 260—243 C **5 Claims**

1. A compound selected from the group consisting of:



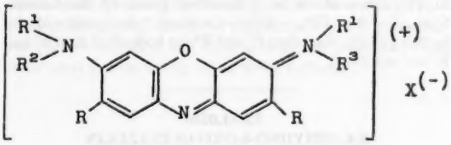
wherein R is selected from the group consisting of (lower)alkyl, tolyl, xylyl, phenyl, naphthyl, benzyl, β-phenylethyl, α-phenylpropyl, α-phenylethyl, α-naphthylethyl, and phenoxy(lower)alkyl and naphthoxy(lower)alkyl; R^1 is selected from the group consisting of (lower)alkyl, phenyl, naphthyl, phenyl sulfonyl and naphthyl sulfonyl; R^3 is selected from the group consisting of hydrogen, hydroxyl, (lower)alkanoyloxy; benzoyloxy,; R^4 is selected from the group consisting of hydrogen or a pharmaceutically acceptable cation and *n* is 1 or 0.

3,894,014
PRODUCTION OF OXAZINE DYES

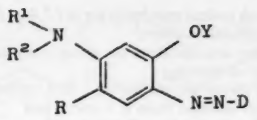
Hans Baumann, Ludwigshafen, and Udo Mayer, Frankenthal, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Feb. 26, 1973, Ser. No. 335,695
Claims priority, application Germany, Mar. 2, 1972, 2210074
Int. Cl. C09b *19/00*
U.S. Cl. 260—244 R **11 Claims**

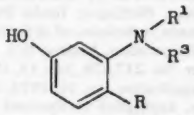
1. A process for the production of an oxazine dye of the formula:



in which
R is hydrogen, methyl, methoxy or ethoxy;
R^1 is hydrogen, alkyl of one to four carbon atoms, benzyl or phenylethyl;
R^2 is hydrogen, alkyl of one to four carbon atoms, cyanoethyl, hydroxyalkyl of two or three carbon atoms, phenyl or methylphenyl;
R^3 is hydrogen, alkyl of one to four carbon atoms or cyanoethyl; and
$X^{(-)}$ is an anion. which process comprises:
reacting at a temperature within the approximate range from 50°C. to 150°C. a compound of the formula:



with a compound of the formula:



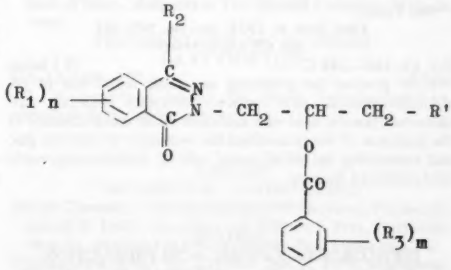
in the presence of an acid condensing agent selected from the group consisting of inorganic or organic acids, phenol, complex glycol or glycerol boric acids, and Lewis acids,
Y being alkyl,
D being phenyl; phenyl substituted by methyl, chloro, methoxy or sulfonic acid; naphthyl; or naphthyl substituted by sulfonic acid and
R, R^1, R^2 and R^3 having the same meaning given above.

3,894,015
BASICALLY SUBSTITUTED 1(2H)-PHTHALAZINONE DERIVATIVES

Adolf Stachel, deceased, late of Frankfurt am Main; by Lydia Katharina Stachel, heiress, Offenbach; Rudi Beyerle, Bruchkobel; Wilhelm Kunze, Bad Homburg v.d.H.; Rolf-Eberhard Nitz, Bergen-Enkheim, and Josef Scholtholt, Frankfurt, Germany, assignors to Cassella Farbwerke Maindur Akt., Frankfurt am Main-Fechenheim, all of Germany

Division of Ser. No. 237,957, March 24, 1972, Pat. No. 3,845,052. This application May 11, 1973, Ser. No. 359,405
Claims priority, application Germany, Mar. 27, 1971, 2114884
Int. Cl.[2] C07D *51/06*
U.S. Cl. 260—247.2 A **6 Claims**

1. Basically substituted 1(2H)-phthalazinone derivatives having the general formula



and their pharmaceutically acceptable acid addition salts, wherein R′ stands for a radical selected from the group consisting of 5,6 or 7-membered heterocyclic nitrogen bases, which contain in addition to the nitrogen atom a corresponding number of methylene groups as well as, optionally, an additional member selected from the group consisting of a nitrogen, an oxygen and a sulfur atom, said radical being bound via a nitrogen atom,
R_1 stands for a member selected from the group consisting of a hydrogen atom and an alkoxy radical having 1 to 4 carbon

atoms, which radical may be in the 6,7 7,8 or 5,6,7 position of the phthalazine nucleus,

R_2 is a member selected from the group consisting of hydrogen, methyl or benzyl;

R_3 stands for alkoxy groups having 1 to 4 carbon atoms,

m is an integer selected from 1, 2 and 3 and

n is an integer selected from 2 and 3.

3,894,016
POLYACRYLATES OF ISOCYANURATES

Juergen Habermeier, Pfeffingen; Daniel Porret, Binningen, and Ernst Leumann, Arlesheim, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

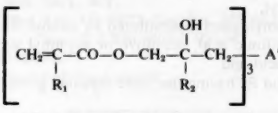
Division of Ser. No. 217,629, Jan. 13, 1972, Pat. No. 3,808,226. This application Jan. 16, 1974, Ser. No. 433,629

Claims priority, application Switzerland, June 14, 1971, 8634/71; Jan. 15, 1971, 624/71

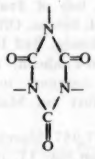
Int. Cl. C07d *55/38*

U.S. Cl. 260—248 NS **2 Claims**

1. A triacrylate of the formula



wherein R_1 and R_2 independently of one another each represent a hydrogen atom or the methyl group and A' is a radical of the formula



3,894,017
PREPARATION OF ALKALI METAL SALTS OF DICHLOROISOCYANURIC ACID

John A. Wojtowicz, Cheshire, Conn., and Wade Wolfe, Jr., Lake Charles, La., assignors to Olin Corporation, New Haven, Conn.

Filed Sept. 4, 1974, Ser. No. 503,204

Int. Cl. C07d *55/40*

U.S. Cl. 260—248 C **19 Claims**

1. A process for preparing an alkali metal salt of dichloroisocyanuric acid which comrpises reacting trichloroisocyanuric acid with sufficient alkali metal chloride in the presence of water to effect the evolution of chlorine gas, and recovering the alkali metal salt of dichloroisocyanuric acid produced thereby.

3,894,018
DICHLOROISOCYANURIC ACID PRODUCTION

John A. Wojtowicz, Cheshire, and William C. Herms, Meriden, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Sept. 4, 1974, Ser. No. 503,203

Int. Cl. C07d *55/40*

U.S. Cl. 260—248 C **15 Claims**

1. A process for preparing dichloroisocyanuric acid which comprises:

a. admixing finely-divided trichloroisocyanuric acid particles having a particle size of less than about 60 microns with water to form a mixture containing from about 30 to about 98 percent by weight of water,

b. maintaining said finely divided trichloroisocyanuric acid particles in contact with said water until said particles of trichloroisocyanuric acid are completely wet,

c. heating said wet particles to a temperature above about 90° C., whereby hypochlorous acid and water are vaporized and evolved, and a solid dichloroisocyanuric acid residue is formed.

3,894,019
S-TRIAZINE DERIVATIVES CONTAINING NAPHTHYLAMINO GROUPS

Hermann Westlinning, Kleinostheim; Werner Schwarze, Frankfurt, and Horst Fleischhauer, Grossauheim, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

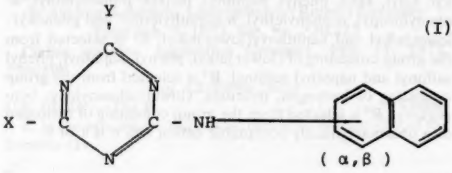
Filed Nov. 9, 1972, Ser. No. 305,139

Claims priority, application Germany, Nov. 10, 1971, 21557697

Int. Cl. C07d *55/18, 55/20*

U.S. Cl. 260—249.5 **30 Claims**

1. A 1,3,5-triazine derivative of the formula:



(I)

wherein X is

or —SR^6, and Y is

or —SR^7,

R^1, R^2, R^3 and R^4 being hydrogen, alkyl of 1 to 18 carbon atoms, phenyl, allyl or methallyl alkyl may be substituted by —OH, —OR^5 (R^5 being lower alkyl) or —CN and wherein R^1 and R^3 may also be α-naphthyl or β-naphthyl with the provision that the R^2 or R^4 group which is attached to the same N must then be hydrogen; and wherein R^6 and R^7 are alkyl of 1 to 18 carbon atoms or a thioether group of the formula $C_nH_{2n+1} - S - CH_2 - CH_2 -$, n being 1 to 18 and with the further proviso that when R^1 and R^2 are both alkyl then R^3 and R^4 are not alkyl.

3,894,020
3,4,-DIHYDRO-4-OXO-QUINAZOLIN (3)-YL-(THIONO)-PHOSPHORIC (PHOSPHONIC) ACID ESTERS

Fritz Maurer; Hans-Jochem Riebel; Lothar Rohe, all of Wuppertal; Wolfgang Behrenz; Ingeborg Hammann, both of Loeln, and Wilhelm Stendel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

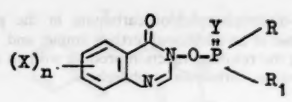
Filed May 2, 1973, Ser. No. 356,646

Claims priority, application Germany, May 10, 1972, 2223025

Int. Cl. C07d *51/48*

U.S. Cl. 260—251 P **7 Claims**

1. A 3,4-dihydro-4-oxo-quinazolino(thiono)-phosphoric (phosphonic) acid ester of the formula



(I)

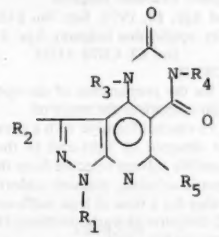
in which
R is alkoxy with 1 to 6 carbon atoms,
R_1 is alkyl, alkoxy or alkylmercapto with 1 to 6 carbon atoms, or phenyl,
X is hydrogen or halogen,
Y is oxygen or sulfur, and
n is an integer from 1 to 4.

3,894,021
DERIVATIVES OF 1,7-DIHYDRO-2H-PYRAZOLO[4',3':5,6]PYRIDO[4,3-D]PYRIMIDINE-2,4-(3H)-DIONES

Theodor Denzel, Nurnberg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 28, 1974, Ser. No. 437,461
Int. Cl. C07d *51/42*
U.S. Cl. 260—256.4 F **13 Claims**

1. A compound of the formula



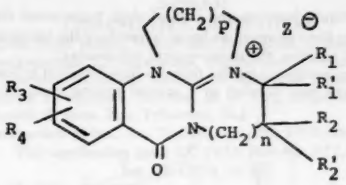
wherein R_1 is hydrogen, lower alkyl, phenyl or phenyl-lower alkyl; R_2 is hydrogen, lower alkyl or phenyl; R_3 is hydrogen, lower alkyl, phenyl, phenyl-lower alkyl, (lower alkyl) amino-lower alkyl or di(lower alkyl)amino -lower alkyl; R_4 is lower alkyl, phenyl, (lower alkyl)-phenyl or three to six carbon cyclo-lower alkyl; and R_5 is hydrogen or lower alkyl, said lower alkyl groups having up to seven carbons.

3,894,022
TETRACYCLIC QUINAZOLINONES AND QUINAZOLINIUM SALTS

Goetz E. Hardtmann, Florham Park, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

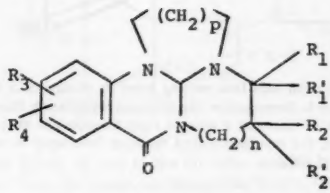
Filed June 25, 1973, Ser. No. 373,474
Int. Cl. C07d *51/42*
U.S. Cl. 260—256.4 F **12 Claims**

1. A compound of the formulae:



IA

or



IB

wherein
p is 0 or 1 n is 0 or 1
each of R_1 and R_1'
is, independently, hydrogen or methyl,
each of R_2 and R_2'
is, independently, hydrogen or alkly of 1 or 2 carbon atoms, provided no more than 3 or R_1, R_1', R_2 and R_2' are alkyl, each of R_3 and R_4
is, independently, hydrogen, halo of atomic weight of from 18 to 36, alkyl of 1 to 3 carbon atoms or alkoxy of 1 to 3 carbon atoms, and
Z^- is a pharmaceutically acceptable inorganic anion, or
a pharmaceutically acceptable acid addition salt of a compound of the formula IB.

3,894,023
5-PIVALOYLOXY-5-(1-PHENYLETHYL) BARBITURIC ACID

Carlos M. Samour, Wellesley, and Julius A. Vida, Billerica, both of Mass., assignors to The Kendall Company, Walpole, Mass.

Filed July 12, 1973, Ser. No. 378,482
Int. Cl. C07d *51/20*
U.S. Cl. 260—257 **1 Claim**

1. A compound having the name 5-pivaloyloxy-5-(1-phenylethyl) barbituric acid.

3,894,024
METHOD FOR CASTING RESINS

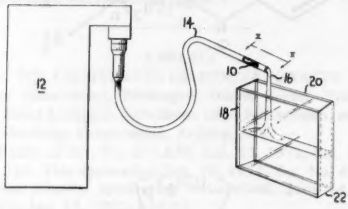
Joseph Cherenko, Valencia; Raymond P. Harrison, Pittsburgh; Joseph D. Kelly, Cheswick, and William I. Frey, Curtisville, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 204,504, Dec. 3, 1971, abandoned, which is a continuation of Ser. No. 881,106, Dec. 1, 1969, abandoned. This application Jan. 9, 1974, Ser. No. 431,995
Int. Cl. B29b *1/04*
U.S. Cl. 264—261 **8 Claims**

1. In a method for making a transparent laminated window from two spaced-apart glass sheets separated by a cured resinous interlayer, said method comprising mixing at a first mixing zone essentially immiscible, reactive constituents, followed by flowing said mixture into and through a conduit connecting and separating the first mixing zone from a pair of spaced-apart transparent rigid sheets, said mixture partially reacting in the conduit to form a flowable resinous liquid; casting said

resinous liquid between the pair of rigid transparent sheets and curing the cast resinous liquid to produce the transparent laminated window, the improvement comprising:

a. subsequently mixing the resinous liquid while it is flowing through said conduit in a second mixing zone located



apart from said first mixing zone by means of a mixing device to homogenize the resinous liquid such that when it is cast between a pair of rigid transparent sheets and cured, the resultant cured resinous interlayer is visually free of striae.

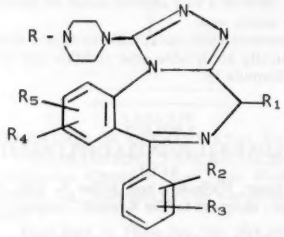
3,894,025

1-PIPERAZINO-6-PHENYL-4H-S-TRIAZOLO[4,3-A][1,4]-ENZODIAZEPINE COMPOUNDS

Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 21, 1974, Ser. No. 453,195
Int. Cl. C07d *57/02*
U.S. Cl. 260—268 TR **10 Claims**

1. A compound of the formula II



II

wherein R is hydrogen, alkyl of 1 to 3 carbon atoms, inclusive, or β-hydroxyethyl; wherein R_1 is hydrogen or alkyl defined as above; and wherein R_2, R_3, R_4 and R_5 are hydrogen, alkyl as defined above, fluoro, chloro, bromo, nitro or trifluoromethyl, and the pharmacologically acceptable acid addition salts thereof.

3,894,026

PRODUCTION OF THEBAINE

Paul Sohar, Warren, and Erwin F. Schoenewaldt, Watchung, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 16, 1973, Ser. No. 407,004
Int. Cl. C07j *43/28*
U.S. Cl. 260—285 **15 Claims**

1. The process which comprises the steps of:

reacting salutaridinol with a lower aliphatic C_{2-4}) acid anhydride or with thionyl chloride, thionyl bromide, phosphorous oxychloride, phosphorous oxybromide, phosphorous trichloride, phosphorous tribromide, phosphorous pentachloride, phosphorous pentabromide, phosgene, methane sulfonyl chloride, and sulfur dioxide, methane sulfonyl bromide, methylchlorocarbonate, benzylchlorocarbonate or p-dinitrophenylchlorocarbonate in the presense or absense of an additional tertiary amine; and

treating the resulting reaction product with an alkali metal hydroxide, carbonate or phosphate.

3,894,027

RESOLUTION OF RACEMIC RETICULINE AND RACEMIZATION OF ITS ENANTIOMERS

Paul Sohar, Warren, and Erwin F. Schoenewaldt, Watchung, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed July 31, 1973, Ser. No. 384,185
Int. Cl. C07d *33/32*
U.S. Cl. 260—286 R **14 Claims**

1. The process which comprises the steps of reacting (±) -reticuline with mandelic acid enantiomer in a suitable solvent medium,

seeding the resulting reaction mixture with a crystalline diastereomeric salt of the enantiomeric acid and a reticuline enantiomer, and

separating and recovering the crystalline diastereomeric salt of the enantiomeric acid and the reticuline enantiomer corresponding to said seeding crystalline diastereomeric salt.

3,894,028

PROCESS FOR THE PREPARATION OF OPTICAL ANTIPODE OF VINCAMINE AND NEW INDOLE DERIVATIVES

Jean Levy, Reims, France, assignor to Omnium Chimique Societe Anonyme, Brussels, Belgium

Filed Apr. 10, 1972, Ser. No. 242,743
Claims priority, application Belgium, Apr. 15, 1971, 765795
Int. Cl. C07d *33/48*
U.S. Cl. 260—287 R **17 Claims**

1. A process for the preparation of the optical antipode of vincamine, which comprises the steps of:

a. oxidizing (+)-vincadifformine with a peracid under nitrogen, in the absence of light and in the presence of a water-immiscible solvent selected from the group consisting of aromatic solvents, aliphatic chlorinated hydrocarbons and ether for a time at least sufficient for producing (+)-1,2-dehydro-16-carbomethoxy-16-hydroxy-N-oxyaspidospermidine; and

b. reducing the (+)-1,2-dehydro-16-carbomethoxy-16-hydroxy-N-oxyaspidospermidine of step (a) in the presence of a liquid low molecular weight organic acid with triphenylphosphine for a time at least sufficient for forming a product comprising a mixture of the optical antipodes of:

1. vicamine,
2. 16-epi-vicamine, and
3. apo-vincamine.

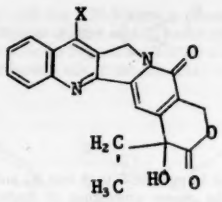
3,894,029

PRODUCTION OF CAMPTOTHECIN AND CAMPTOTHECIN-LIKE COMPOUNDS

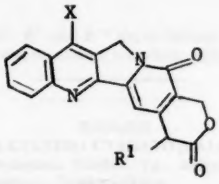
Ekkehard Winterfeldt, Grossburgwedel, and Tilmann Korth, Hannover, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen, Rhine, Germany

Filed Aug. 16, 1972, Ser. No. 281,115
Claims priority, application Germany, Aug. 26, 1971, 2142715; Oct. 8, 1971, 2150234
Int. Cl. C07d *39/00*
U.S. Cl. 260—287 R **4 Claims**

1. A process for producing a compound of the formula:



wherein X is a member of the group consisting of hydrogen and chlorine which comprises dissolving a compound of the formula



wherein R^1 is ethyl and X is selected from the group consisting of hydrogen and chlorine in a solvent, and selectively oxidizing said compound by allowing molecular oxygen to act thereon in the presence of a oxidation catalyst selected from the group consisting of salts of cerium (IV), copper, silver, chromium, manganese, iron, cobalt, nickel, mercury, palladium and platinum at a pH from about 8 to about 4.

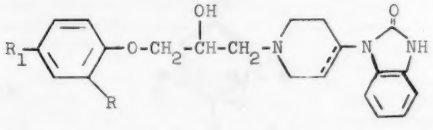
3,894,030

1-[1-(2-HYDROXY-3-ARYLOXYPROPYL)-4-PIPERIDYL]-2-BENZIMIDAZOLINONES AND RELATED COMPOUNDS

Paul Adriaan Jan Janssen, Vosselaar; Ineke Van Wijngaarden, Beerse, and Willem Soudijn, Turnhout, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 321,509, Jan. 4, 1973, Pat. No. 3,181,017.
This application Feb. 6, 1974, Ser. No. 459,500
Int. Cl. C07d *49/38*
U.S. Cl. 260—293.6 **5 Claims**

1. A chemical compound selected from the group consisting of a benzimidazoline derivative having the formula:



and the therapeutically active acid addition salts thereof, wherein R is a member selected from the group consisting of cyano and loweralkoxycarbonyl; R_1 is a member selected from the group consisting of hydrogen, halo and loweralkenyl; and the dotted line represents an optional bond.

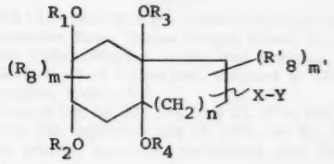
3,894,031

INDANTETROL DERIVATIVES

Frederic Peter Hauck, Somerville; Joyce Reid, Highland Park; Venkatachala L. Narayanan, Hightstown; Christopher M. Cimarusti, Hamilton; Rudiger D. Haugwitz, Titusville, and Joseph E. Sundeen, Trenton, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation of Ser. No. 71,229, Sept. 10, 1970, abandoned.
This application June 21, 1973, Ser. No. 372,448
Int. Cl. C07d *29/24*
U.S. Cl. 260—293.56 **9 Claims**

1. A compound of the structure



wherein R_1, R_2, R_3 and R_4 are the same or different and are selected from the group consisting of hydrogen, lower alkyl, trifluoromethyl, mono-halo-lower alkyl wherein the halogen is F, Cl, Br or I, lower alkanoyl, amido, lower alkoxyalkylene and lower alkoxy carbonyl, X is a single bond or a straight or branched chain alkylene group of the structure $(CH_2)_{n'}$ wherein n' is 0 to 10, Y

wherein R_5 and R_6 are the same or different and are selected from the group consisting of hydrogen, lower alkyl, trifluoromethyl, monocyclic cycloalkyl having 3 to 6 ring members, monocyclic cycloalkyl lower alkyl, wherein the cycloalkyl has 3 to 6 ring members, hydroxy-lower alkyl, phenyl, lower alkylphenyl, di(lower alkyl)phenyl, halophenyl, mono-, di-or trinitrophenyl, phenylalkyl, monocyclic heterocyclic, wherein alkyl contains 1 to 8 carbons, R_8 and R'_8 are lower alkyl or cycloalkyl having 3 to 6 ring members, and

can be taken together to form a heterocyclic radical; wherein the heterocyclic radicals represented by R_5, R_6 or

taken together contain 5-, 6- or 7-members in the heterocyclic ring, the ring being pyrrolidine, piperidine, morpholine, thiamorpholine, piperazine or homopiperazine, and *n* is 1 to 3; *m* and *m'* are 0, 1 or 2; stereoisomers thereof, physiologically acceptable acid salts thereof, physiologically acceptable quaternary salts thereof and N-oxides thereof.

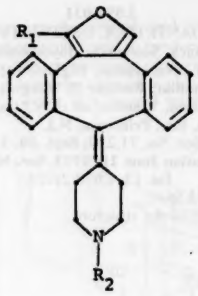
3,894,032

10,11-FURO DERIVATIVES OF CYPROHEPTADINE

David C. Remy, North Wales, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 10, 1974, Ser. No. 459,493
Int. Cl. C07d *29/12*
U.S. Cl. 260—293.58 **10 Claims**

1. A compound of the formula:



wherein R_2 is lower alkyl having from one to five carbon atoms, and R_1 is hydrogen or lower alkyl having from one to five carbon atoms, and the nontoxic, pharmaceutically acceptable acid addition salts thereof.

3,894,033

5-ARYLTETRAZOLES

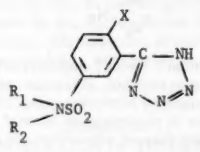
Gerald F. Holland, Old Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed May 16, 1974, Ser. No. 470,512

Int. Cl. C07d *29/34*

U.S. Cl. 260—293.69 **12 Claims**

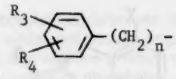
1. A compound selected from those of the formula



and the pharmaceutically acceptable basic salts thereof, wherein

X is selected from the group consisting of methyl, chloro, fluoro and bromo;

R_1 is selected from the group consisting of hydrogen and alkyl having from 1 to 4 carbon atoms;



wherein n is an integer of 0 to 3 and R_3 and R_4 are each selected from the group consisting of hydrogen, methyl, chloro and bromo; and

R_1 and R_2 when considered together with the nitrogen atom to which they are attached form a heterocyclic ring selected from the group consisting of morpholino, hexamethyleneimino, piperidino and mono- and dimethylpiperidino.

3,894,034

PROCESS FOR PRODUCING AZASULFONIUM SALTS

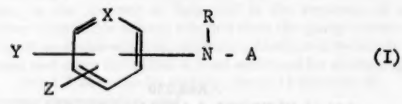
Paul G. Gassman, and Gordon D. Gruetzmacher, both of Columbus, Ohio, assignors to The Ohio State Research Foundation, Columbus, Ohio

Filed Jan. 29, 1973, Ser. No. 327,294

Int. Cl. C07d *31/48*

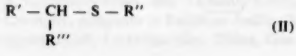
U.S. Cl. 260—294.8 R **8 Claims**

1. A process which comprises (a) reacting a compound of the formula:



(I)

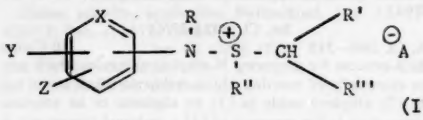
wherein R is hydrogen or a hydrocarbon radical free of aliphatic unsaturation containing 1 to 8 carbon atoms; X is —CH= or —N=, and Y and Z are hydrogen, halogen, nitro, cyano, amino, lower alkylamino, lower alkyl, lower alkyloxy, lower-alkanoyloxy, or a carbonyloxy-lower alkyl, or carbonyloxy-phenyl, and A is chlorine or bromine, with a sulfide of the formula:



(II)

wherein R′ is hydrogen, lower alkyl or phenyl; R″, taken separately, is lower alkyl or phenyl, and R‴, taken separately, is hydrogen or lower alkyl, or phenyl, and R″ and R‴ when

taken together with the -CH-S- moiety denote a ring containing 3 to 5 methylene carbon atoms, under substantially anhydrous conditions, in an organic solvent for a time sufficient to form an azasulfonium salt of the formula:



(III)

wherein:

X, Y, Z, R, R', R'' and R''' are as defined above, and A is a halogen ion, or another ion which replaces the halogen ion.

3,894,035

BIS-(THIOALKYLTHIO CYANATO)HALO PYRIDINES

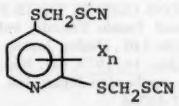
Penelope B. Domenico, Fairfax, Va., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 15, 1974, Ser. No. 461,063

Int. Cl. C07d *31/50*

U.S. Cl. 260—294.8 G **4 Claims**

1. A compound corresponding to the formula



wherein X is chloro or bromo and *n* is an integer of from 2 or 3.

3,894,036

CERTAIN 3-OXO-2(HALOPHENYL)-4,5,6,7-TETRAHYDRO-V-TRIAZOLO[1,5A]-PYRIDINES

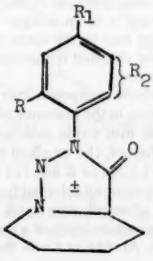
Marwan J. Abu-el-Haj, Groton, and James W. McFarland, Lyme, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 170,996, Aug. 11, 1971, abandoned. This application Sept. 10, 1973, Ser. No. 395,713

Int. Cl.[2] C07D *31/44*

U.S. Cl. 260—295 K **6 Claims**

1. A compound of the formula



wherein

R is hydrogen, halogen, methyl, or nitro;

R_1 is halogen; and

R_2 is hydrogen, halogen, or nitro.

3,894,037

CERTAIN ISOTHIOCYANOBENZIMIDAZOLES

Paul Brenneisen, Basel; Thomas Wenger, Riehen, Basel; Jean-Jacques Gallay, Magden, Aayau, and Wolfgang Schmid, Neuallschwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

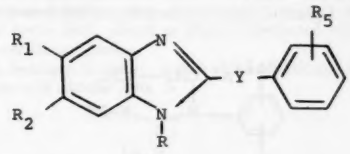
Division of Ser. No. 255,334, May 22, 1974, Pat. No. 3,840,550. This application July 24, 1974, Ser. No. 491,585

Claims priority, application Switzerland, May 24, 1971, 7542/71

Int. Cl. C07d *49/38*

U.S. Cl. 260—309.2 **13 Claims**

1. An isothiocyanobenzimidazole compound of the formula



—NH—

wherein R is hydrogen or methyl; one of R_1, R_2 and R_5 is isothiocyano and the others are selected from the group consisting of hydrogen, isothiocyano, nitro, chlorine, alkyl of from 1 to 4 carbon atoms and methoxy; and Y is oxygen, sulphur or —NH—.

3,894,038

HYDROXYALKYL DERIVATIVES OF ALKYLENE-BIS-HYDANTOINS

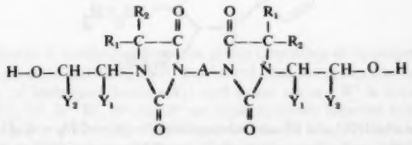
Juergen Habermeier, Allschwil; Hans Batzer, Arlesheim, and Daniel Porret, Binningen, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 118,499, Feb. 24, 1971, Pat. No. 3,821,242. This application Jan. 4, 1973, Ser. No. 321,102

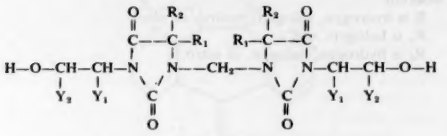
Int. Cl. C07d *49/32*

U.S. Cl. 260—309.5 **5 Claims**

1. An alcohol of the formula:



or



wherein Y_1 is hydrogen, Y_2 is ethyl, or wherein Y_1 and Y_2 together are trimethylene or tetramethylene; R_1 and R_2 is hydrogen or lower alkyl of 1 to 4 carbon atoms or R_1 and R_2 together are tetramehtylene or pentamethylene; and A is alkylene of 1 to 12 carbon atoms or lower alkylene interrupted by one oxygen atom.

3,894,039

1-HALOPHENYL-2-IMINO-IMIDAZOLIDINES

Rudolf Hiltmann; Hartmund Wollweber, both of Wuppertal-Elberfeld, and Günther Hermann, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

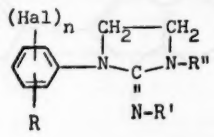
Filed Aug. 7, 1972, Ser. No. 278,699

Claims priority, application Germany, Aug. 12, 1971, 2140405

Int. Cl. C07d *49/30, 49/34*

U.S. Cl. 260—309.7 **10 Claims**

1. A 1-phenyl-2-imino-imidazolidine of the formula:



(I)

in which

Hal is halogen,

R is hydrogen, halogen, lower alkyl, lower alkoxy or halo-lower alkyl,

R' and R'' each independently is hydrogen or alkyl of one to six carbon atoms, and

n is 1, 2, 3 or 4,

or a salt thereof.

3,894,040

2,5,6,7-TETRAHYDRO-3H-IMIDAZO(1,2-D)(1,4)BENZODIAZEPINE-5,6-DICARBOXYLIC ACID ESTERS

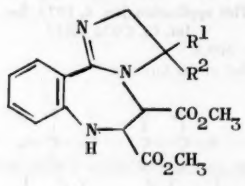
George C. Buzby, Jr., Philadelphia, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Sept. 16, 1974, Ser. No. 506,085

Int. Cl. C07d *49/34*

U.S. Cl. 260—309.6 **5 Claims**

1. A compound of the formula:



in which R^1 and R^2 are independently —H, $—CH_3$, $—C_2H_5$ or C_3H_7, and pharmaceutically acceptable acid addition salts thereof.

3,894,041

PROCESS FOR PREPARING N-ETHYLOL CARBAZOLE

Hiroshi Otsuki, Tokyo; Kenzo Sakuma, Kanagawa, and Isamu Matsuzawa, Tokyo, all of Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo, Japan

Filed Oct. 26, 1973, Ser. No. 410,152

Claims priority, application Japan, Oct. 30, 1972, 47-107941

Int. Cl. C07d *27/68*

U.S. Cl. 260—315 **10 Claims**

1. A process for preparing N-ethylol carbazole, which consists essentially of reacting (1) a carbazole alkali metal salt with (2) ethylene oxide in (3) an aliphatic or an aromatic hydrocarbon in the presence of (4) a carbonyl compound, to obtain a reaction product containing N-ethylol carbazole and then decomposing the reaction product with water to obtain said N-ethylol carbazole.

3,894,042

PREPARATION OF INDOLES AND CATALYST COMPOSITIONS USED IN THEIR PREPARATION

Kunio Tanaka, and Toshio Fukada, both of Hino, Japan, assignors to Teijin Ltd., Osahn, Japan

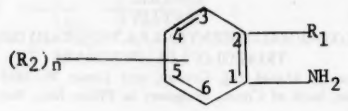
Filed Jan. 16, 1973, Ser. No. 324,084

Claims priority, application Japan, Jan. 25, 1972, 47-9244; Apr. 22, 1972, 47-40766

Int. Cl. C07d *27/56*

U.S. Cl. 260—319.1 **7 Claims**

1. In the process for preparing indoles by the vapor phase catalytic reaction of compounds of the following formula:



(1)

wherein R_1 is selected from the group consisting of phenyl or cyclohexyl substituted and unsubstituted alkyl of two to eight carbon atoms and phenyl or cyclohexyl substituted and unsubstituted alkenyl of two to eight carbon atoms, R_2 is selected from the group consisting of amino, alkylamino, hydroxy, alkoxy and cyano, halogens and the substituted and unsubstituted hydrocarbon groups of not more that C_8, and *n* is an integer from 0 to 4, which several R_2-groups may be the same or different when *n* is from 2 to 4, at an elevated temperature in the absence of molecular oxygen;

the improvement which comprises carrying out said vapor phase catalytic reaction in the presence of a catalyst consisting essentially of (a) an iron oxide selected from FeO, Fe_2O_3, Fe_3O_4 or mixtures thereof, (b) an alkali metal compound of a metal selected from Li, Na or K and (c) up to 30% by weight of the catalyst of a compound selected from the group consisting of a compound of an alkaline earth metal selected from Be, Mg, Ca, Sr or Ba and an oxide of a metal element selected from Cr, Mo, W, Bi, Al, Mn or Ce in the presence of steam.

3,894,043

IMIDES, THEIR MANUFACTURE AND THEIR USE AS MICROBIOCIDES

Hans Moser, Magden/AG; Elmar Sturm, Aesch, and Raphael Menasse, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

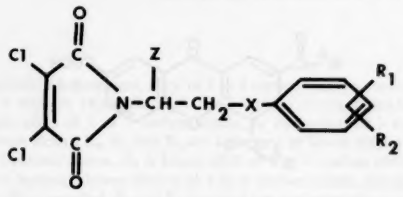
Filed Jan. 8, 1973, Ser. No. 321,624

Claims priority, application Switzerland, Jan. 12, 1972, 438/72; Dec. 4, 1972, 17626/72

Int. Cl. C07d *27/18*

U.S. Cl. 260—326.5 S 6 Claims

1. Compounds of the formula



wherein Z represents hydrogen or methyl, X represents oxygen, sulphur or the group NR_3, in which R_3 represents hydrogen or methyl, R_1 represents hydrogen, chlorine, bromine or trifluoromethyl, and R_2 represents hydrogen, halogen, methyl or trifluoromethyl.

3,894,044

1-ALKENYLTHIS AND CHLOROALKYLTHIA-CARBONYL)-OCTAHYDROINDOLES

Elmar Sturm, Arlesheim; Hans Joerg Cellarius, Riehen, and Christian Vogel, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

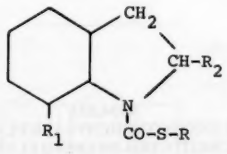
Division of Ser. No. 216,778, Jan. 10, 1972, Pat. No. 3,776,912. This application Sept. 10, 1973, Ser. No. 395,884

Claims priority, application Switzerland, Jan. 14, 1971, 553/71

Int. Cl. C07d *27/56*

U.S. Cl. 260—326.12 R 2 Claims

1. A compound of the formula



wherein R is chloroalkyl having 2 or 3 carbon atoms or a straight chain or branched alkenyl having 3 or 4 carbon atoms; and one of R_1 and R_2 is hydrogen and the other is hydrogen or methyl.

3,894,045

1-ACYLOXY(LOWER) ALKYL-3-SUBSTITUTED PYRROLIDINE DERIVATIVES AND PROCESS FOR PREPARING SAME

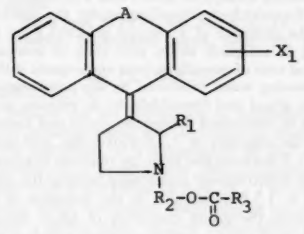
Suminori Umio, Kawanishi, and Hiroshi Nojima, Suita, both of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Mar. 1, 1973, Ser. No. 336,942

Int. Cl. C07d *70/04, 27/04*

U.S. Cl. 260—326.33 9 Claims

1. A compound of the formula



wherein A is ethylene or oxygen,

R_1 is hydrogen or lower alkyl,

R_2 is lower alkylene,

R_3 is lower alkyl, phenyl or phenyl substituted with 1–3 lower alkoxyl groups,

X_1 is hydrogen or chloro, and its pharmaceutically acceptable acid addition salts.

3,894,046

DITHIOLANYL ANILIDS

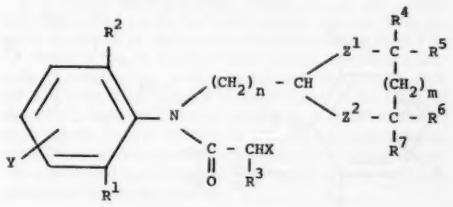
Sidney B. Richter, Chicago, and John Krenzer, Oak Park, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 357,746, May 7, 1973. This application June 3, 1974, Ser. No. 475,543

Int. Cl. C07d *71/00*

U.S. Cl. 260—327 M 2 Claims

1. A compound of the formula



wherein Y is selected from the group consisting of hydrogen, lower alkyl and halogen; R^1 is selected from the group consisting of hydrogen, lower alkyl and lower alkoxy; R^2 is lower alkyl; R^3, R^4, R^5, R^6 and R^7 are independently selected from the group consisting of hydrogen and lower alkyl; X is halogen; *m* is the integer 0; Z^1 and Z^2 are sulfur; and *n* is an integer from 1 to 2.

3,894,047
PROCESS FOR THE PREPARATION OF 1,3,6-TRIOXOCANE

Takami Ishii, Chiba; Naohisa Takikawa, and Katsumi Furukawa, both of Ube, all of Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Dec. 3, 1973, Ser. No. 421,482
Claims priority, application Japan, Dec. 5, 1972, 47-121211
Int. Cl.[2] C07D *323/00*
U.S. Cl. 260—338 7 Claims

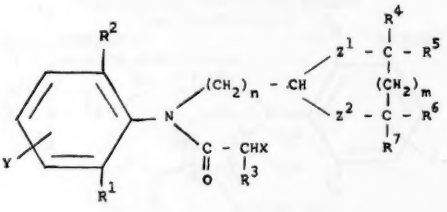
1. In a process for the preparation of 1,3,6-trioxocane comprising reacting diethylene glycol with a substance capable of releasing formaldehyde therefrom under the reaction conditions in the presence of a catalyst selected from the group consisting of inorganic acids, acid salts of inorganic acids, alkali metal salts of persulfuric acid and organic sulfonic acids while removing water produced by the condensation of the diethylene glycol and formaldehyde, to prepare an oligomer consisting of condensed diethylene glycol and formaldehyde, cyclizing the oligomer to 1,3,6-trioxocane, and isolating the resultant 1,3,6-trioxocane from the reaction mixture by distillation, the improvement comprising heating the oligomer to cyclize it to 1,3,6-trioxocane, in the presence of a catalyst selected from the group consisting of alkali metal salts of persulfuric acid, ferrous sulfate and ferric sulfate at a temperature of 150° to 250°C under a normal or reduced pressure while distilling the resultant 1,3,6-trioxocane to isolate it from the reaction mixture.

3,894,048
DITHIEPANYL ANILIDS

Sidney B. Richter, Chicago, and John Krenzer, Oak Park, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 357,746, May 7, 1973. This application June 3, 1974, Ser. No. 475,547
Int. Cl. C07d *75/00*
U.S. Cl. 260—327 M 2 Claims

1. A compound of the formula



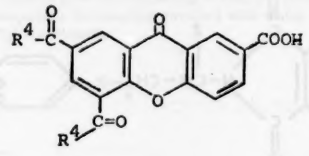
wherein Y is selected from the group consisting of hydrogen, lower alkyl and halogen; R^1 is selected from the group consisting of hydrogen, lower alkyl and lower alkoxy; R^2 is lower alkyl; R^3, R^4, R^5, R^6 and R^7 are independently selected from the group consisting of hydrogen and lower alkyl; X is halogen; *m* is the integer 2; Z^1 and Z^2 are sulfur; and *n* is an integer from 1 to 2.

3,894,049
DISUBSTITUTED XANTHONE CARBOXYLIC ACID COMPOUNDS

Jurg R. Pfister, Los Altos; Ian T. Harrison, and John H. Fried, both of Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 259,852, June 5, 1972, which is a continuation-in-part of Ser. No. 217,287, Jan. 12, 1972, Pat. No. 3,849,565. This application Jan. 8, 1974, Ser. No. 431,794
Int. Cl. C07d *7/44*
U.S. Cl. 260—335 2 Claims

1. The compound of the formula:



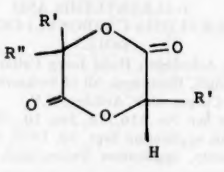
wherein R^4 is lower alkyl, and the pharmaceutically acceptable, non-toxic alkyl or glycerol esters, amides and salts thereof.

3,894,050
CHLORINATED GLYCOLIDE

Donald Roy Maulding, Branchburg Twp., N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 248,768, April 28, 1972, abandoned. This application July 8, 1974, Ser. No. 486,716
Int. Cl. C07d *15/16*
U.S. Cl. 260—340.2 1 Claim

1. A compound of the formula:



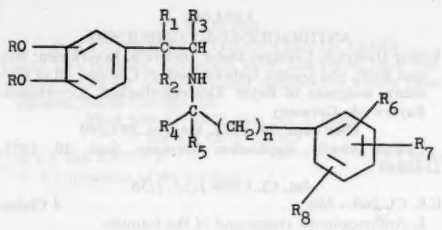
wherein R′ is a chloro- substituent, and R″ is a chloro- or hydrogen substituent.

3,894,051
N-METHYLENEDIOXYPHENYLALKYL)-β-(ALKYL)-DISUBSTITUTED PHENETHYLAMINES

John T. Suh, Mequon, Wis., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed July 5, 1973, Ser. No. 376,686
Int. Cl. C07d *13/10*
U.S. Cl. 260—340.5 9 Claims

1. A compound of the formula



in which R is hydrogen, alkyl of 1 to 4 carbon atoms or benzyl, R_1 is straight chain alkyl of 1 to 7 carbon atoms, branched chain alkyl of 3 to 7 carbon atoms, or cycloalkyl of 3 to 7 carbon atoms, R_2, R_3 and R_4 are hydrogen or lower alkyl of 1 to 4 carbon atoms, R_5 is lower alkyl of 1 to 4 carbon atoms, R_6 is hydroxy, lower alkoxy of 1 to 4 carbon atoms, halogen or trifluoromethyl, R_6 and R_7 together are methylenedioxy and *n* is 1 or 2.

3,894,052

CYCLIC ETHYLENE ACETALS OF 3-ACETOXY-2-FORMYL-5-OXOCYCLOPENTANEHEPTANOIC ACID

Norman L. Wendler, Summit, and David Taub, Metuchen, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 48,548, June 22, 1970, Pat. No. 3,736,335. This application Nov. 24, 1972, Ser. No. 309,389

Int. Cl. C07d *13/04*

U.S. Cl. 260—340.9 **2 Claims**

1. 3-Acetoxy-2-formyl-5-oxocyclopentaneheptanoic acid lower alkyl ester, 5-cyclic ethylene acetal.

3,894,053

2-OXYGENATED 5-(1,2,3,4-TETRAHYDRO-6-METHOXY-2-NAPHTHYL)-1-ETHYLCYCLOPENTANEACETIC ACID AND SALTS, ESTERS, AND A LACTONE THEREOF

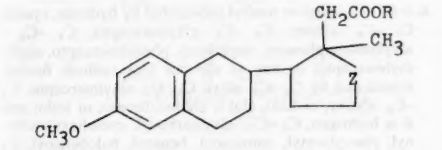
John H. Dygos, Northbrook, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed Apr. 23, 1974, Ser. No. 463,294

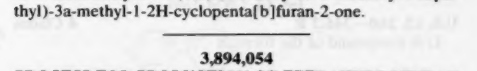
Int. Cl. C07d *5/06*

U.S. Cl. 260—343.3 **7 Claims**

1. A compound of the formula



wherein R represents hydrogen, alkali metal, lower alkyl, or benzyl and Z represents carbonyl or optionally-esterified hydroxymethylene of the formula



in which R′ represents hydrogen, lower alkanoyl, or benzoyl.

4. cis-Hexahydro-4-(1,2,3,4-tetrahydro-6-methoxy-2-naphthyl)-3a-methyl-1-2H-cyclopenta[b]furan-2-one.

3,894,054

PROCESS FOR PRODUCTION OF TETRAHYDROFURAN

Bunji Miya, Tokyo, Japan, assignor to Kao Soap Co., Ltd., Tokyo, Japan

Filed July 5, 1973, Ser. No. 376,724

Claims priority, application Japan, Sept. 18, 1972, 47-93457

Int. Cl. C07d *5/02*

U.S. Cl. 260—346.1 R **3 Claims**

1. In a process for the production of tetrahydrofuran by catalytically hydrogenating and dehydrating maleic anhydride, in the gas phase, at a temperature of 200° to 300°C, under a pressure of 10 to 50 kg/cm², employing a molar ratio of hydrogen: maleic anhydride of from 10 : 1 to 200 : 1, the improvement which comprises: employing as the catalyst in the reaction a metal oxide catalyst composition consisting essentially of a mixture of (A) a catalyst component obtained by calcining at from 950° to 1,150°C a silica-alumina catalyst having a silica:alumina molar ratio of 0.03 to 0.5 : 1 and (B) a copper-chromium-zinc catalyst component, wherein the amount of said copper-chromium-zinc catalyst component in the mixture is 30 to 80 wt. %.

3,894,055

CATALYTIC OXIDATIVE DEHYDROGENATION OF ALKENES OR ALKADIENES TO FURAN COMPOUNDS

Floyd E. Farha, Jr.; Marvin M. Johnson, and Donald C. Tabler, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 19, 1973, Ser. No. 380,723

Int. Cl. C07d *5/14*

U.S. Cl. 260—346.1 R **16 Claims**

7. A process in accordance with claim **6** wherein said promoter is cobalt.

3,894,056

CATALYTIC OXIDATIVE DEHYDROGENATION OF ALKENES OR ALKADIENES TO FURAN COMPOUNDS

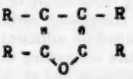
Brent J. Bertus; Donald C. Tabler, and Marvin M. Johnson, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 23, 1973, Ser. No. 381,552

Int. Cl. C07d *5/14*

U.S. Cl. 260—346.1 R **15 Claims**

1. A process which comprises reacting oxygen and at least one unsaturated acyclic feed hydrocarbon selected from the group consisting of alkenes and alkadienes having from 4 to 10 carbon atoms, in contact with a catalyst consisting essentially of molybdenum, cobalt, phosphorus, and oxygen, with an atom ratio of phosphorus to molybdenum in the range of about 0.5:1 to about 5:1 and an atom ratio of cobalt to molybdenum in the range of about 0.1:1 to about 3:1, under suitable vapor-phase reaction conditions for conversion of said at least one unsaturated acyclic feed hydrocarbon to at least one furan compound having the formula



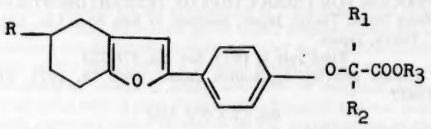
wherein each R is individually selected from the group consisting of hydrogen and alkyl radicals having from 1 to 6 carbon atoms, the total carbon atoms in the R radicals being in the range of 0 to 6; and recovering at least a portion of the furan compounds thus produced.

3,894,057
TETRAHYDROBENZOFURANYLPHENOXYCARBOXYLIC ACIDS, ESTERS

Richard C. Effland, Somerville, N.J., assignor to American Hoechst Corporation, Bridgewater, N.J.

Filed May 28, 1974, Ser. No. 474,010
Int. Cl. C07d 5/40
U.S. Cl. 260—346.2 R 4 Claims

1. A compound of the formula



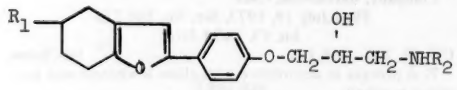
in which R is hydrogen or alkyl of from 1 to 4 carbon atoms; R_1 is hydrogen, methyl or ethyl; R_2 is hydrogen, methyl, ethyl or phenyl; and R_3 is hydrogen or alkyl of from 1 to 3 carbon atoms.

3,894,058
TETRAHYDROBENZOFURANYLPHENOXYPROPYLAMINES

Richard C. Effland, Somerville, and Marc N. Agnew, Plainsboro, both of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Filed May 17, 1974, Ser. No. 471,123
Int. Cl. C07d 5/40
U.S. Cl. 260—346.2 R 8 Claims

1. A compound of the formula:



wherein R_1 is hydrogen or alkyl of from 1 to 5 carbon atoms and R_2 is alkyl of from 1 to 5 carbon atoms, cycloalkyl of from 3–7 carbon atoms, phenyl or phenalkyl of from 7-10 carbon atoms; and the physiologically tolerable acid addition salts thereof.

3,894,059
PROCESS FOR THE OXIDATION OF OLEFINES

Thillyampalam Selvaratnam, Sale, England, assignor to Petrocarbon Developments Limited, Manchester, England

Filed Apr. 30, 1973, Ser. No. 355,437
Claims priority, application United Kingdom, May 3, 1972, 20696/72
Int. Cl. C07d 1/04, 1/12, 1/14
U.S. Cl. 260—348.6 18 Claims

1. A process for the production of an oxirane compound comprising the steps of:

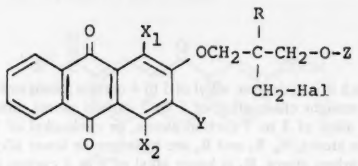
1. reacting at a temperature not greater than 10°C. but above the freezing temperature of the system an olefinically unsaturated compound, carbon dioxide, water and a hypohalite in quantities sufficient to produce an aqueous product mixture comprising substantially equimolar quantities of bicarbonate and vic-halohydrin; and
2. heating at least a portion of said aqueous product mixture to a temperature resulting in reaction together of said vic-halohydrin and said aqueous bicarbonate to form an oxirane compound.

3,894,060
ANTHRAQUINONE COMPOUNDS

Volker Hederich, Cologne; Dieter Dieterich, Leverkusen; Helmut Reiff, and Gunter Gehrke, both of Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Sept. 29, 1972, Ser. No. 293,590
Claims priority, application Germany, Sept. 30, 1971, 2148849
Int. Cl. C09b 1/54, 1/56
U.S. Cl. 260—380 4 Claims

1. Anthraquinone compound of the formula



wherein

X_1 is hydroxyl or amino;

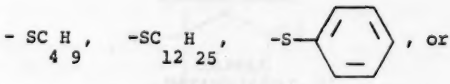
X_2 is hydroxyl, amino, C_1 –C_6 -alkylamino, cyclohexylamino, C_1 –C_6 -alkylcyclohexylamino, phenylamino, halophenylamino, C_1 –C_9 -alkylphenylamino, C_1 –C_4 -alkoxyphenylamino, C_1 –C_4 -alkylmercaptophenylamino, trifluoromethylphenylamino, acetylaminophenylamino, diphenylamino, phenoxyphenylamino, phenylaminophenylamino, naphthylamino, C_1 –C_{12} -alkylmercapto, phenylmercapto, halophenylmercapto, C_1 –C_4 -alkylphenylmercapto, C_1 –C_4 -alkoxyphenylmercapto, or radicals having the formula

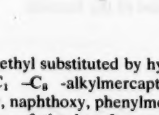
—NH—CO—T or —NH—SO_2 —T

where

T is C_1 –C_{17} -alkyl, cyclohexyl, phenyl, halophenyl, C_1 –C_4 -alkylphenyl, C_1 –C_4 -alkoxyphenyl, C_1 –C_4 -alkylmercaptophenyl, or C_1 –C_{17} -alkyl substituted by chloro, cyano, hydroxyl or C_1 –C_4 -alkoxy;

Y is hydrogen, chloro, bromo,





R is C_1 –C_4 -alkyl or methyl substituted by hydroxy, cyano, C_1 –C_8 -alkoxy, C_1 –C_9 -alkylmercapto, C_1 –C_6 -alkylamino, phenoxy, naphthoxy, phenylmercapto, naphthylmercapto, or any of the last four radicals further substituted by C_1 –C_9 -alkyl, C_1 –C_4 -alkylmercapto, C_1 –C_4 -alkoxy, or halo; Hal is chloro, bromo, or iodo; and Z is hydrogen, C_1 –C_{17} -alkylcarbonyl, cyclohexylcarbonyl, phenylacetyl, cinnamoyl, benzoyl, halobenzoyl, C_1 –C_4 -alkylbenzyl, C_1 –C_4 -alkoxybenzoyl, phenylbenzoyl, phenoxybenzoyl, naphthoyl, C_1 –C_{17} -alkylcarbonyl substituted by halo, acetyl, phenoxy, cyano, or C_1 –C_4 -alkoxy.

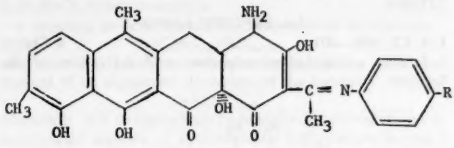
3,894,061

ANILINO DERIVATIVES OF CHELOCARDIN

Daniel Tim-Wo Chu, Greenfield Park, and David Lyon Garmaise, Montreal, both of Canada, assignors to Abbott Laboratories, North Chicago, Ill.

Filed July 11, 1973, Ser. No. 378,305
Int. Cl. C07c *143/82*
U.S. Cl. 260—397.7 R **3 Claims**

1. A compound of the formula:



wherein R is sulfamyl, or acetylsulfamyl or a corresponding tautomeric form or a pharmaceutically acceptable acid addition salt thereof.

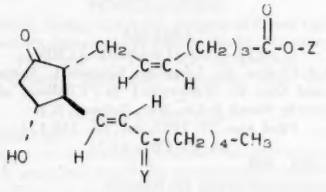
3,894,062

SUBSTITUTED PHENYL AND NAPHTHYL ESTERS OF PGE_2

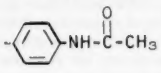
Walter Morozowich, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

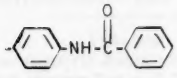
Filed Nov. 23, 1973, Ser. No. 418,387
Int. Cl.[2] C09B *11/06;* **C07C** *69/074*
U.S. Cl. 260—395 **25 Claims**

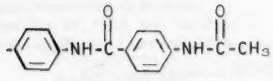
1. An optically active compound of the formula:

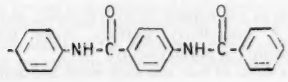


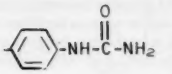
or a racemic compound of that formula and the mirror image thereof, wherein Z is

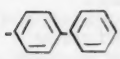


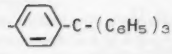


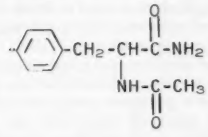


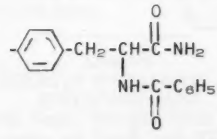


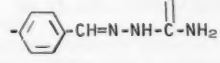


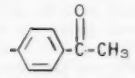


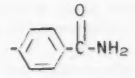


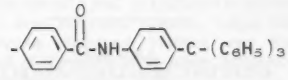


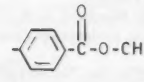


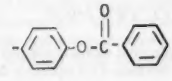


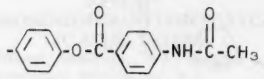


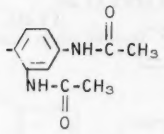


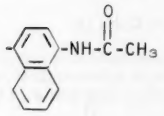


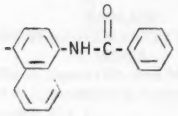




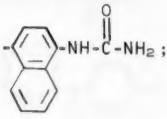




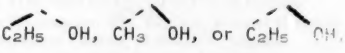




or



and wherein Y is , ,



3,894,063

SELECTIVE DEHALOGENATION OF 6 ALPHA-FLUORO-9 ALPHA-HALO 11 BETA-HYDROXY STEROIDS

Henry Laurent, and Rudolf Wiechert, both of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

Filed Apr. 8, 1974, Ser. No. 459,098

Claims priority, application Germany, Apr. 19, 1973, 2320999

Int. Cl.[2] C07c *169/32*

U.S. Cl. 260—397.45 **8 Claims**

1. A process for the selective dehalogenation of the 9-halogen atom of 6α-fluoro-9α-halo-11β-hydroxy-Δ^4- and $\Delta^{1,4}$-3-keto steroids wherein halo is Cl, Br or I, which comprises dehalogenating with a trialkyltin hydride.

3,894,064

ω-AMINOALKANESULPHONIC ACID DERIVATIVES

Gunther Boehmke, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

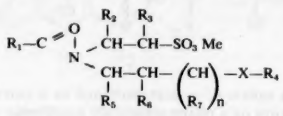
Filed June 22, 1973, Ser. No. 372,607

Claims priority, application Germany, June 24, 1972, 2231070

Int. Cl.[2] C07C *143/90*

U.S. Cl. 260—401 **6 Claims**

1. New ω-aminoalkanesulphonic acid derivatives of the formula



in which

R_1 represents an optionally substituted C_8–C_{22}-alkyl or C_8–C_{22}-alkenyl radical,

R_2 and R_3 independently of one another denote hydrogen or a C_1–C_2-alkyl radical and

R_5, R_6 and R_7 independently of one another denote hydrogen or a C_1–C_6-alkyl radical,

n is 0 or 1,

X represents oxygen or sulphur,

R_4 denotes hydrogen, a C_1–C_6-alkyl, cycloalkyl, aralkyl or an aryl radical and

Me denotes a cation

3,894,065

ARYL-OXO-ALKANOIC ACIDS

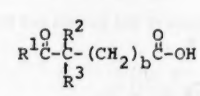
Edward J. Cragoe, Jr., Lansdale; Kenneth L. Shepard, Ambler, and Otto W. Woltersdorf, Jr., Chalfont, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 27, 1973, Ser. No. 355,121

Int. Cl. C07c *63/52*

U.S. Cl. 260—408 **11 Claims**

1. A compound having the formula

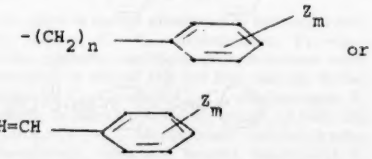


where

R^1 represents alkyl of 1–3 carbons or cyclopropyl;

R^2 represents phenyl, halophenyl, loweralkylphenyl or loweralkoxyphenyl;

R^3 represents



where n is an odd number up to 7, m is 0–2, and Z is halogen, loweralkyl, loweralkoxy, hydroxy, cyano, trifluoromethyl, hydroxymethyl or acyloxymethyl;

b has a value of 6–8; and salts esters and amides thereof.

3,894,066
METHOD FOR MAKING HIGHER ALKYL TIN THICHLORIDES
Max Buschhoff, Luenen, and Karl Heinz Mueller, Werne, both of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany
Filed Jan. 25, 1974, Ser. No. 436,795
Claims priority, application Germany, Jan. 31, 1973, 2304617
Int. Cl. C07f 7/22
U.S. Cl. 260—429.7 2 Claims

1. The method of making octyltin trichloride of the formula $C_8H_{17}SnCl_3$ which comprises

a. reacting an octyl aluminum compound of the formula $(C_8H_{17})_xAlCl_{3-x}$ $_{3-x}$,

wherein x is 1, 2, or 3, or mixtures thereof, with a calculated amount of an aluminum alcoholate of the formula

$Al(OR')_3$ $_3$,

wherein R′ is a straight-chain or branched-chain saturated or unsaturated aliphatic or cycloaliphatic hydrocarbon having 3 to 18 carbon atoms, to form at least one intermediate compound of a formula selected from the group consisting of

$C_8H_{17}Al(OR')Cl$

$(C_8H_{17})_2Al(OR')$

and

$C_8H_{17}Al(OR')_2$ $_2$;

b. reacting said intermediate with a stoichiometric amount of tin tetrachloride to form the desired octyltin trichloride; and

c. isolating said octyltin trichloride from the reaction mixture by converting the dealkylated aluminum moiety to a water-soluble species at a pH outside the range of 3.5 to 13.

3,894,067
PRODUCTION OF PENICILLAMINE-MERCURIC-MERCAPTIDE AND OF PENICILLAMINE AND ACID ADDITION SALTS OF PENICILLAMINE
Manfred Bock, Berlin, Germany, assignor to Firma Heyl & Co. Chemisch-Pharmazeutische Fabrik, Berlin, Germany
Filed Mar. 22, 1972, Ser. No. 236,962
Claims priority, application Germany, Mar. 24, 1971, 2114329
Int. Cl. C07f 3/10
U.S. Cl. 260—431 6 Claims

1. Method of producing penicillamine-mercuric-mercaptide, which comprises reacting a compound selected from the group consisting of penicilloic acid and penilloic acid with a mercuric salt in a mol ratio of 1:0.3 – 1:0.7 in a medium of at least one water miscible organic solvent and water in a ratio of organic solvent to water of between about 1:3 and 3:1, thereby forming penicillamine-mercuric-mercaptide in crystalline form which precipitates in such form from the solution and penilloaldehyde as by-product which remains dissolved in the solution, whereby the precipitated crystalline penicillamine-mercuric-mercaptide can be easily separated from the solution containing the by-product.

3,894,068
MANUFACTURE OF BASIC LEAD STYPHNATE
George William Charles Taylor, 7 The Cobbins, Waltham Abbey, Essex, and Arwyn Theophilus Thomas, 66 Gillmans Rd., Orpington, Kent, both of England
Filed Jan. 15, 1963, Ser. No. 252,271
Claims priority, application United Kingdom, Jan. 15, 1962, 1478/62
Int. Cl. C07f 7/24
U.S. Cl. 260—435 A 4 Claims

1. A process for the manufacture of basic lead styphnate in the beta polymorphic form which comprises forming an aqueous solution of alkali metal styphnate which contains 2-nitroresorcinol, reacting the solution so formed with an aqueous solution of a compound selected from the group consisting of lead nitrate and lead acetate whereby a precipitate of beta polymorphic basic lead styphnate is formed, and separating out the beta polymorphic basic lead styphnate from the reaction mixture.

3,894,069
PROCESS FOR PREPARING DITHIODICARBONYL METAL COMPLEXES
Donald G. Ries, Brookhaven, Miss., assignor to Nalco Chemical Company, Oak Brook, Ill.
Filed Aug. 3, 1973, Ser. No. 385,418
Int. Cl. C07f 15/02, 15/04, 15/06
U.S. Cl. 260—439 R 9 Claims

1. A process for preparing a dithiodicarbonyl metal complex which comprises:

a. reacting an acyloin with a phosphorus sulfide in the presence of ammonium ion in a solvent and

b. reacting the reaction solution from (a) with an aqueous solution of a reactive water soluble ionizable compound of a heavy metal to form a dithiodicarbonyl metal complex, the quantity of said ammonium ion corresponding to 0.1 to 2.0 $(NH_4)^+$ equivalents per mole of said acyloin, and said acyloin being selected from the group consisting of benzoin and substituted benzoins in which the substituents are from the group consisting of methyl, chloro- and methoxy, said ammonium ion being derived from substances from the group consisting of ammonia, and water soluble ammonium, amine and quaternary salts, and said heavy metal being selected from the group consisting of iron, cobalt and nickel.

3,894,070
SULFATE ESTERS OF POLYALKOXY ADDUCTS OF ETHYLENEDIAMINE
Iwao Tomiyama, Nanjo; Tadayoshi Sakai, Fukui; Shinobu Hashizume, Asuwa, and Kanjin Ikeda, Fukui, all of Japan, assignors to Nikka Chemical Industrial Co., Ltd., Fukui, Japan
Filed Aug. 8, 1972, Ser. No. 278,830
Int. Cl. C07c 93/04, 141/00
U.S. Cl. 260—458 1 Claim

1. A surface-active compound produced by reacting ethylene diamine and propylene oxide at a temperature of 100° to 120°C, to obtain a reaction product comprising tetra-polyoxypropylene ethylene diamine, treating said diamine with potassium hydroxide and adding thereto ethylene oxide at a temperature of about 190° to 200°C to obtain an intermediate product, sulfonating said intermediate product with chlorosulfonic acid at a temperature ranging between about 20° and 35°C, and neutralizing the reaction mixture with aqueous sodium hydroxide to obtain the desired surface-active compound having 10 oxypropylene groups and 60 oxyethylene groups.

3,894,071
PROCESS FOR PRODUCING DIAMINOMALEONITRILE
Eiji Nishiwaki, Arai; Shigeharu Yamazoe, Tokyo; Mitsuyuki Hoshino, Urawa; Sadafumi Yoshino, and Katsunori Mikuma, both of Kurashiki, all of Japan, assignors to Nippon Soda Company, Limited, Japan
Filed Sept. 26, 1973, Ser. No. 400,858
Claims priority, application Japan, Dec. 11, 1972, 47-123381; Sept. 29, 1972, 47-97139
Int. Cl. C07c 121/42, 121/02
U.S. Cl. 260—465.5 R 9 Claims

1. In a process for the production of diaminomaleonitrile by tetramerization of hydrogen cyanide in a nonprotonic polar solvent selected from the group consisting of dimethylsulfoxide, dimethylformamide, dimethylacetoamide, hexamethylphosphoroamide and mixtures thereof, in the presence of a basic catalyst selected from the group consisting of alkali

cyanide, alkali hydroxide, ammonia, trialkylamine and mixtures thereof, the improvement which comprises tetramerizing hydrogen cyanide at a temperature ranging from 15°C to 100°C in the presence of at least one alkylmercaptan containing 1 to 8 carbon atoms wherein the amount of said alkylmercaptan is in the range of 0.1 to 8 weight percent of the amount of non-protonic polar solvent.

3,894,072

α-AMINOMETHYL-HYDROCINNAMONITRILES

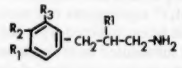
Joseph Albert Meschino, North Wales, Pa., assignor to McNeil Laboratories, Incorporated, Ft. Washington, Pa.

Division of Ser. No. 149,797, June 3, 1971, abandoned, which is a division of Ser. No. 850,280, June 9, 1969, abandoned, which is a division of Ser. No. 596,100, Nov. 22, 1966, Pat. No. 3,483,186. This application Sept. 27, 1973, Ser. No. 401,532

Int. Cl. C07c *121/78*

U.S. Cl. 260—465 E **2 Claims**

1. A chemical compound having the formula:



wherein R′ is cyano, R_1 is lower alkoxy; and each of R_2 and R_3 are selected from the group consisting of hydrogen and lower alkoxy.

3,894,073

EXTRACTION OF PYRETHRUM

David George Alexander, Westella, and Allen Forster, Hull, both of England, assignors to Rose, Downs & Thompson Limited, Kingston-upon-Hull, England

Filed Jan. 24, 1972, Ser. No. 219,954

Claims priority, application United Kingdom, Jan. 28, 1971, 3366/71

Int. Cl. C07c *67/06*

U.S. Cl. 260—468 H **13 Claims**

1. A process for extracting pyrethrins from a pyrethrin containing material, which process comprises the steps of:

a. making a solution of the material in a first hydrocarbon solvent for pyrethrins having **4-8** carbon atoms,

b. extracting the pyrethrins from said solution into a second organic solvent for pyrethrins miscible with water selected from the group consisting of methanol and ethanol and having a water content such that it achieves substantially complete extraction of said pyrethrins into said second solvent, and

c. back-extracting said pyrethrins from said second solvent into an organic solvent for pyrethrins different from said second solvent after partially evaporating said second solvent to increase the proportion of water and pyrethrins therein until the pyrethrins are extracted preferentially into said different solvent.

3,894,074

2,4-BIS(TRIFLUOROMETHYL)-6-NITROPHENOL COMPOUNDS

Klaus Wagner; Ludwig Eue; Robert R. Schmidt, and Ernst Roos, all of Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

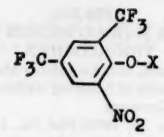
Filed Feb. 23, 1973, Ser. No. 335,400

Claims priority, application Germany, Feb. 29, 1972, 2209528

Int. Cl. C07c *125/06*

U.S. Cl. 260—468 E **7 Claims**

1. 2,4-bis-(trifluoromethyl)-6-nitrophenol compound of the formula



wherein

X is N,N-dimethylaminocarbonyl or —CO—NH—R^7; and

R^7 is alkyl of from 1 to 4 carbon atoms, alkenyl of from 2 to 4 carbon atoms, cycloalkyl of from 5 to 6 ring carbons, or phenyl.

3,894,075

PREPARATION OF HYDROXYL-TERMINATED POLYESTERS

Löwhardt A. A. Schoen, Geleen, Netherlands, assignor to Stamicarbon, N.V., Geleen, Netherlands

Filed Mar. 8, 1971, Ser. No. 122,217

Claims priority, application Netherlands, Mar. 7, 1970, 7003277

Int. Cl. C07c *69/66*

U.S. Cl. 260—484 A **6 Claims**

1. In a process for producing a hydroxy-terminated polyester by the catalytic polymerization of at least one lactone at a temperature of about 50° to about 250°C, the improvement consisting of conducting the polymerization in the presence of a catalyst, the catalyst consisting essentially of a bimetallic alkoxide derived from a bifunctional alcohol of up to about 10 carbon atoms, one metal in said bimetallic oxide being an alkali metal, and the other metal in said bimetallic alkoxide being selected from the group consisting of boron, aluminum, titanium and zirconium.

3,894,076

PRODUCTION OF ALKYL ESTERS OF UNSATURATED MONOCARBOXYLIC ACIDS

Roger L. Van Duyne, Seabrook; Adolfo Aguilo, and Dudley J. McCracken, both of Corpus Christi, all of Tex., assignors to Celanese Corporation, New York, N.Y.

Filed Jan. 24, 1974, Ser. No. 436,247

Int. Cl. C01c *69/54*

U.S. Cl. 260—486 R **8 Claims**

1. A continuous process for the production of a lower alkyl ester of an alpha-beta unsaturated monocarboxylic acid in which ester the alcohol moiety contains from 2 to 4 carbon atoms and in which ester the acid moiety contains 3 or 4 carbon atoms, which process comprises:

a. in a mass transfer zone to which a gaseous alpha-monoolefin of 2 to 4 carbon atoms is supplied so as to maintain an atmosphere of said gaseous alpha-monoolefin as a continuous phase, effecting the mass transfer of said alpha-monoolefin into liquid droplets of a hereafter defined recycle stream recycled from the hereafter defined first reaction zone, so as to obtain an alpha-monoolefin enriched liquid,

b. in a first reaction zone mixing and reacting the alpha-monoolefin enriched liquid so obtained in said mass transfer zone with a substantially anhydrous sulfuric acid medium, said sulfuric acid medium being substantially comprised of the residual liquid recycled from the hereafter defined recovery zone together with make-up sulfuric acid, said first reaction zone being operated at a temperature within the range of about 100° to 160°C, and at a pressure of about 100 to 300 psig,

c. withdrawing a portion of the reaction mixture from said first reaction zone and recycling such as said recycle stream to the said mass transfer zone,

d. passing the reaction mixture obtained from said first reaction zone to a second reaction zone, adding to and

reacting with such reaction mixture obtained in said first reaction zone an anhydrous alpha-beta unsaturated monocarboxylic acid containing three or four carbon atoms, said second reaction zone being operated at a temperature within the range of about 100° to 150°C and a pressure within the range of about 100 to 300 psig,

e. in a recovery zone treating the effluent from said second reaction zone so as to recover said lower alkyl ester of the alpha-beta unsaturated monocarboxylic acid therefrom, and

f. recycling at least a portion of the residual liquid from said separation zone to said first reaction zone;

wherein said process is effected under substantially anhydrous conditions and wherein said process the rate of circulation and recirculation of the various streams therein is such that the residence time of the liquid reactants in the loop comprised of said first reaction zone and said mass transfer zone is from 8 to 20 minutes, and such that the residence time of the reactants in said second reaction zone is from 9 to 16 minutes.

3,894,077

ANTISTATIC AGENT FOR PLASTICS

Takeshi Horikawa; Hiroshi Yagihara, and Masayoshi Kubo, all of Saitama, Japan, assignors to Daicel Ltd., Osaka, Japan

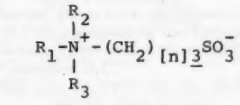
Filed Feb. 25, 1974, Ser. No. 445,587

Claims priority, application Japan, Feb. 27, 1973, 48-23518

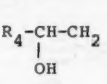
Int. Cl. C07c *143/00*

U.S. Cl. 260—501.12 **3 Claims**

1. An antistatic agent of the formula;



wherein R_1 is hydroxyalkyl having the formula



in which R_4 is alkyl having 6 to 16 carbon atoms, R_2 is the same as R_1 or alkyl having 1 to 4 carbon atoms, and R_3 is alkyl having 1 to 4 carbon atoms.

3,894,078

5-ACETAMIDO-2,4-DIMETHYLTRIFLUOROMETHANESULFONANILIDE

Tomas L. Fridinger, Woodbury Village, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 12, 1973, Ser. No. 331,676

Int. Cl. C07c *143/74*

U.S. Cl. 260—501.19 **2 Claims**

1. 5-Acetamido-2,4-dimethyltrifluoromethanesulfonanilide or a horticulturally acceptable salt thereof.

3,894,079

PREPARATION OF 2,5-DIBROMOTEREPHTHALIC ACID

James O. Knobloch, Naperville, Ill., assignor to Standard Oil Company, Chicago, Ill.

Filed Dec. 29, 1972, Ser. No. 319,500

Int. Cl. C07c *63/26, 63/30*

U.S. Cl. 260—515 A **4 Claims**

1. A process for the preparation of a 2,5-dibromoterephthalic acid compound, which comprises reacting a terephthalic acid compound in a solution of chlorosulfonic acid or fluorosulfonic acid containing sulfur trioxide, in the presence of iodine with bromine at 40° to 80°C.

3,894,080

PHENYLACETIC ACIDS

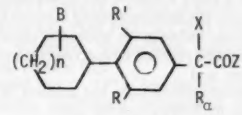
Julius Diamond, Lafayette Hill, and Norman Julian Santora, Roslyn, both of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Continuation of Ser. No. 152,368, Jan. 11, 1971, abandoned, which is a continuation-in-part of Ser. No. 34,870, May 5, 1970. This application Jan. 7, 1974, Ser. No. 431,502

Int. Cl.² C07C *149/233*

U.S. Cl. 260—516 **6 Claims**

1. A compound of the formula



where:

R is loweralkyl;

n is 0-2;

B is hydrogen or loweralkyl;

R is halo, halololoweralkyl or loweralkyl;

R′ is hydrogen, fluoro, chloro, bromo or trifluoromethyl;

X is amidinothio; and

Z is —OH, loweralkoxy, benzyloxy or —OM where M is an alkali, alkaline earth or aluminum metal or an ammonium salt.

3,894,081

RECOVERY OF PENTAHYDRATE TRISODIUM SALT OF CARBOXYMETHOXY SUCCINIC ACID FROM AQUEOUS SOLUTION

William J. Dunlap, Seabrook, Tex., and Carroll W. Lanier, Baker, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 288,030, Sept. 11, 1972, abandoned. This application Feb. 15, 1974, Ser. No. 442,808

Int. Cl. C07c *59/22*

U.S. Cl. 260—535 P **8 Claims**

1. A process for recovering particulate pentahydrate trisodium carboxy methoxy succinic acid from a supersaturated aqueous solution of trisodium carboxy methoxy succinic acid which comprises:

holding said solution at a temperature of from about 0° to about 50°C for a period of time sufficient to permit growth of the particles of pentahydrate trisodium carboxy methoxy succinic acid to a selected particle size, and then separating the particulate pentahydrate trisodium carboxy methoxy succinic acid from the mother liquor.

3,894,082

PROCESS OF MAKING TRIFLUOROACETIC ACID

Günter Fernschild, Ahlem; Heinrich Paucksch, and Joachim Massonne, both of Hannover, all of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hannover, Germany

Filed Jan. 5, 1973, Ser. No. 321,521

Claims priority, application Germany, Jan. 7, 1972, 2200725

Int. Cl.² C07C *51/04*

U.S. Cl. 260—539 A **6 Claims**

1. An improvement in the process of making substantially anhydrous and chlorine-free trifluoroacetic acid in a continuous process by hydrolysis of trifluoroacetyl chloride with

water and distillation, the said improvement comprising carrying out the distillation in a continuous process in a distillation apparatus provided with a distillation column and an attached reflux condenser by

a. introducing in the still of the apparatus gaseous trifluoroacetyl chloride into a boiling mixture of trifluoroacetic acid, water and hydrogen chloride, the boiling point of the mixture being between the boiling point of the azeotropic mixture and 72°C/760 Torr, while

b. withdrawing the major portion of the trifluoroacetic acid condensing at the head of the column from the rising gas mixture at a place ahead of the condenser;

c. absorbing the gas mixture passing through the condenser, which mixture includes the hydrogen chloride formed in the reaction and residual trifluoroacetic acid, in an aqueous solution, and

d. simultaneously introducing the amount of water necessary for the hydrolysis into the still.

3,894,083

AMIDES

Kurt Hofer, Munchenstein, Basel-Land; Guenther Tscheulin, Riehen, Basel-Land, and Anton Voykowitsch, Binningen, Basel-Land, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

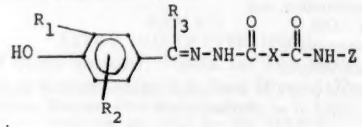
Filed Sept. 14, 1973, Ser. No. 397,227

Claims priority, application Switzerland, Sept. 21, 1972, 13796/72; Oct. 4, 1972, 14472/72

Int. Cl. C07c *103/30*

U.S. Cl. 260—559 H **19 Claims**

1. A compound of the formula



wherein

R_1 is tertiary alkyl (C_4-C_{12}),

R_2 is alkyl (C_1-C_{20}), cycloalkyl (C_5-C_{12}), cycloalkyl (C_5-C_{11}) alkyl (C_1-C_7), phenylalkyl (C_7-C_{12}), phenyl, or phenylalkyl (C_7-C_{12}) or phenyl mono- or di-substituted on the aromatic nucleus thereof by alkyl (C_1-C_6),

R_3 is hydrogen or alkyl (C_1-C_{20}),

X is a direct linkage, a 1,3-or a 1,4-phenylene,

Z is hydrogen ; alkyl (C_1-C_{22}); cycloalkyl (C_5-C_{12}); cycloalkyl (C_5-C_{11}) alkyl (C_1-C_7) phenylalkyl (C_7-C_{12}); phenoxyalkyl (C_7-C_{12}); phenylthioalkyl (C_7-C_{12}); phenylalkyl (C_7-C_{12}), phenoxyalkyl (C_7-C_{12}) or phenylthioalkyl (C_7-C_{12}), monosubstituted on the aromatic nucleus thereof by alkyl (C_1-C_4) or alkoxy (C_1-C_4); phenyl, or phenyl mono-, dior trisubstituted by any combination of the groups alkyl (C_1-C_9), alkoxy (C_1-C_9), alkylthio (C_1-C_9) (with C_1-C_{14} in the aggregate of the substituents alkyl, alkoxy and/or alkylthio), halogen, hydroxyl, cyano, phenoxy, phenyl, phenyl substituted by 1 or 2 alkyls (C_1-C_9) and/or by hydroxy,

and when

Z is alkyl, cycloalkylalkyl or substituted or unsubstituted phenylalkyl, phenoxyalkyl, phenylthioalkyl or alkyl, alkoxy or alkylthio substituted phenyl, then any aliphatic alkyl chain thereof is either uninterrupted or is interrupted by 1 or 2 ether and/or thiother linkages.

3,894,084

PROCESS FOR MAKING ACRYLAMIDE

Darrell L. Werges, Park Forest, and Louis A. Goretta, Naperville, both of Ill., assignors to Nalco Chemical Company, Chicago, Ill.

Filed Apr. 5, 1974, Ser. No. 458,434

Int. Cl. C07c *103/08*

U.S. Cl. 260—561 N **16 Claims**

1. A process for catalytically hydrolyzing acrylonitrile to acrylamide comprising the steps of sequentially

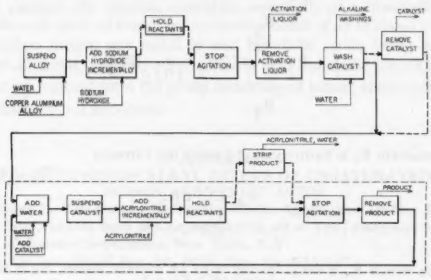
A. suspending in water contained in a reaction zone with agitation copper catalyst particles having a standardized nitrile hydrolysis activity of at least about 50 weight percent and further having a particle size ranging from about 0.002 to 0.1 inches in average diameters, the weight ratio of said water to said catalyst ranging from about 0.02 to 0.20,

B. adding to said water while said catalyst particles are suspended therein at an initial water temperature ranging from about 180° to 300°F incrementally acrylonitrile with agitation, the rate of said addition being such that the temperature of said water is maintained in the range of from about 180° to 300°F., the total amount of acrylonitrile so added being such that the weight ratio of said water to said total acrylonitrile ranges from about 50:50 to 75:25, said rate of addition being such as to produce a total conversion of acrylonitrile to acrylamide in said reaction zone of at least about 45% at the time when said adding is completed,

C. maintaining the resulting mixture in said reaction zone with agitation at a water temperature ranging from about 180° to 300°F until the total conversion of said acrylonitrile to produced acrylamide is at least about 65%,

D. terminating said agitation in said reaction zone, thereby causing said catalyst particles to fall to the bottom of said reaction zone,

E. removing at least a major portion of said acrylamide product solution from said reaction zone while retaining substantially all of said catalyst particles in said reaction zone,



F. charging water to said reaction zone in an amount sufficient to bring the weight ratio of said water to said catalyst into said range of from about 0.02 to 0.20,

G. repeating sequentially steps (A) through (F).

7. The process of claim **1** wherein initially prior to step (A) said process comprises the steps of

A. charging water to said reaction zone,

B. charging an alloy comprising copper and aluminum in a weight ratio of from about 30:70 to 70:30 copper to aluminum in the form of particles having a size ranging from about 0.002 to 0.1 inches in average maximum diameter to said reaction zone to produce an initial weight ratio of said alloy particles to said water in the range from about 0.01 to 0.35,

C. suspending said alloy particles in said water with agitation,

D. adding alkali metal hydroxide to such suspension while maintaining the bulk temperature of said water in the range from about 32° to 180° F., the total quantity of alkali metal hydroxide charged to such suspension ranging from about 0.5 to 20 times the number of moles of aluminum initially present in said alloy, the total time of such adding ranging from about 2 to 50 hours,

E. terminating said agitation in said reaction zone, thereby causing said catalyst particles to fall to the bottom of said reaction zone,

F. removing said water with said alkali metal hydroxide contained therein, and

G. washing with water said catalyst particles until a wash water pH not above about 8.0 is achieved.

3,894,085

2-HALO NITRONES, THEIR MANUFACTURE AND THEIR USE FOR THE MANUFACTURE OF N-SUBSTITUTED ARALIPHATIC ALDEHYDE-NITRONES

Albert Eschenmoser, Kusnacht, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

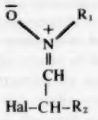
Filed Sept. 18, 1973, Ser. No. 398,511

Claims priority, application Switzerland, Sept. 19, 1972, 13677/72; Oct. 12, 1972, 14962/72

Int. Cl. C07c *119/00*

U.S. Cl. 260—566 R 4 Claims

1. Nitrones of the general formula



wherein Hal represents a bromine or chlorine atom, R_1 denotes 5 or 6 ring-membered cycloalkyl or lower alkyl and R_2 denotes hydrogen or lower alkyl, phenyl or phenyl loweralkyl.

3,894,086

NITRODIFLUORAMINOTERPHENYL COMPOUNDS AND PROCESSES

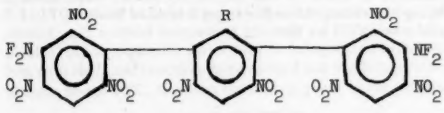
Michael W. Lerom, Menlo Park, and Howard M. Peters, Palo Alto, both of Calif., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Apr. 20, 1972, Ser. No. 246,031

Int. Cl. C07c *87/100*

U.S. Cl. 260—576 3 Claims

1. A nitrodifluoraminoterphenyl compound having the formula



wherein R is a radical selected from the group consisting of H and NO_2.

3,894,087

METHOD OF PRODUCING 2,2,6-TRICHLOROCYCLO-HEXANONE AND COMPOSITIONS THEREOF

Eugene C. Gilbert, Hanover Park; Donald C. McLean, Barrington, and Edward Sherman, Chicago, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Feb. 16, 1971, Ser. No. 115,773

Int. Cl. C07c *49/30*, *37/00*, *45/00*

U.S. Cl. 260—586 R 13 Claims

1. 2,2,6-Trichlorocyclohexanone.

2. A process for the preparation of 2,2,6-trichlorocyclohexanone which comprises:

a. contacting in a non-aqueous system a mixture of chlorine and a substrate selected from the group consisting of cyclohexanone, 2-chlorocyclohexanone, 2,2-dichlorocyclohexanone, and 2,6-dichlorocyclohexanone at a temperature between 0°C. or the temperature at which the reaction mixture is a liquid, whichever is higher, and 120°C. in the presence of an interagent selected from the group consisting of inert saturated hydrocarbons, inert saturated halogenated hydrocarbons, inert saturated carboxylic acids, and 2,2,6-trichlorocyclohexanone; said substrate being in a ratio to said chlorine between one to more than two moles of said chlorine minus one mole for each equivalent of chlorine in said substrate, and one to less than four moles of said chlorine minus one mole for each equivalent of chlorine in said substrate; and

b. separating said 2,2,6-trichlorocyclohexanone from the reaction mixture.

3,894,088

1-ISOPROPENYL-SPIRO[4,5]DEC-6-EN-8-ONES AND A PROCESS FOR PRODUCING THEM

Peter Naegeli, Wettingen, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

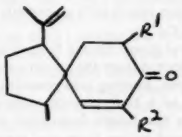
Filed Nov. 7, 1973, Ser. No. 413,471

Claims priority, application Switzerland, Nov. 15, 1972, 16606/72

Int. Cl. C07c *49/44*, *45/00*

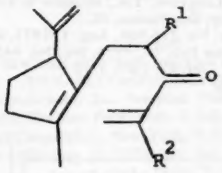
U.S. Cl. 260—586 C 8 Claims

1. Spiro compounds of the general formula



wherein R^1 and R^2 each independently represent a hydrogen atom or a lower alkyl group.

4. A process for the manufacture of the spiro compounds claimed in claim 1, which process comprises cyclising a cyclopentene derivative of the general formula



(II)

wherein R^1 and R^2 have the significance given in claim 1, in an organic solvent in the presence of a Lewis acid, said organic solvent being a member selected from the group consisting of dioxane, diethyl ether, benzene, toluene and nitromethane, said Lewis acid being a member selected from the group consisting of tin tetrachloride and titanium tetrachloride and the reaction being conducted within the range from about −40°C to reflux.

3,894,089

METHOD FOR REACTING ORGANIC HALIDES

Michael F. Farona, Cuyahoga Hills, and James F. White, Akron, both of Ohio, assignors to The University of Akron, Akron, Ohio

Division of Ser. No. 339,637, March 9, 1973, Pat. No. 3,832,403, which is a continuation-in-part of Ser. No. 119,908, March 1, 1971, abandoned. This application Apr. 10, 1974, Ser. No. 459,490

Int. Cl. C07c *49/76*, *49/82*

U.S. Cl. 260—591 9 Claims

1. The process of reacting an organic acyl halide with an aromatic substrate to form an aromatic product comprising the steps of: charging a reaction vessel with a metallic hex-

acarbonyl compound having the formula $M(CO)_6$ wherein M is selected from the group consisting of Cr, Mo and W, adding an aromatic substrate having the formula

wherein R′ is selected from the group consisting of hydrogen, alkyl groups having from 1 to about 6 carbon atoms, alkoxide groups having from 1 to about 4 carbon atoms, aryl and aryloxide groups having from 6 to about 12 carbon atoms including alkyl substituents and hydroxide, reacting said metallic hexacarbonyl compound with part of said aromatic substrate to yield an arene metal tricarbonyl catalyst having the formula

charging the reaction vessel with an organic acyl halide having the formula $R-C<_{X}^{O}$

wherein R is an aryl group having from 6 to about 12 carbon atoms, and X is selected from the group consisting of bromine, chlorine and fluorine, heating said reaction vessel from ambient temperatures to a temperature sufficient to cause said catalyst to remove the halide from said organic halide with generation of an acyl cation from said organic halide so that said acyl cation will attack the remaining part of said aromatic substrate to yield the aromatic product.

3,894,090

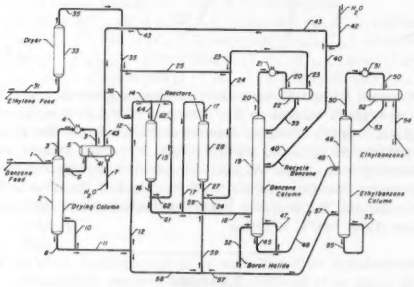
WATER WASHING METHOD FOR BORATE REMOVAL IN AN AROMATIC ALKYLATION PROCESS

Earl J. Cleveland, Longview, Tex., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation of Ser. No. 276,988, Aug. 1, 1972, abandoned. This application Feb. 15, 1974, Ser. No. 443,045

Int. Cl. C07c *3/56*

U.S. Cl. 260—671 R **6 Claims**



1. In a process for the boron halide promoted alkylation of an aromatic hydrocarbon wherein boron oxide hydrates are formed by the reaction of water with a boron halide, the method of removing boron oxide hydrates from the process which comprises the steps of:

a. passing resultant alkylation effluent comprising boron oxide hydrates, an unalkylated aromatic hydrocarbon and alkylated aromatic hydrocarbons into a fractional distillation column;

b. introducing a stream of substantially pure boron halide into the fractional distillation column at a point below the level at which the alkylation effluent passes into the column and therein reacting the boron halide with said boron oxide hydrates to form a volatile complex which is soluble in the unalkylated aromatic hydrocarbon;

c. removing as a side-cut stream from said column the resultant solution of the volatile boron oxide hydrate complex in unalkylated aromatic hydrocarbon;

d. admixing water with said side-cut stream and transferring the boron oxide hydrates from said solution to the water, thereby forming a mixed-phase liquid stream comprising water and unalkylated aromatic hydrocarbon; and

e. separating water from said liquid stream and returning resultant dried unalkylated aromatic hydrocarbon to the aforesaid boron halide promoted aromatic alkylation reaction.

3,894,091

PROCESS FOR PRODUCTION OF ACROLEIN

Kouzou Sakakibara; Iwao Abe, and Kazuyuki Matsuoka, all of Saitama, Japan, assignors to Daicel Ltd., Osaka, Japan

Filed July 5, 1973, Ser. No. 376,317

Claims priority, application Japan, July 6, 1972, 47-68001

Int. Cl. C07c *45/04*

U.S. Cl. 260—604 R **6 Claims**

1. In a process for the production of acrolein by catalytically oxidizing propylene in the gaseous phase with a molecular oxygen-containing gas, at a temperature of 250° to 400°C., the improvement which comprises conducting the reaction in the presence of a metal oxide catalyst, the metal content of which is expressed by the following empirical formula:

$$(Mo)_a(Bi)_b(Fe)_c(Sb)_d(L)_e$$

in which L is one or more metals selected from the group consisting of K, Rb and Cs, and *a*, *b*, *c*, *d* and *e* represent the numbers of atoms of Mo, Bi, Fe, Sb and L, respectively, *a* being 12, *b* being 0.5 to 6, *c* being 3 to 12, *d* being 0.01 to 1.0, and *e* being 0.1 to 10.

3,894,092

P,P′-DISUBSTITUTED ALPHA-TRICHLOROMETHYLBENZYL ETHERS

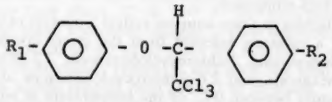
Robert L. Metcalf; Inder Kapoor, and Asha Hirwe, all of Urbana, Ill., assignors to University of Illinois Foundation, Urbana, Ill.

Filed Dec. 26, 1972, Ser. No. 318,206

Int. Cl. C07c *43/20*

U.S. Cl. 260—613 R **4 Claims**

1. Insecticides having the formula



where R_1 and R_2 are the same or different C_1 to C_2 alkoxy groups.

3,894,093
PROCESS FOR THE MANUFACTURE OF ADDITION PRODUCTS OF ETHYLENE OXIDE AND COMPOUNDS CONTAINING MOBILE HYDROGEN
Friedrich Raizner, deceased, late of Hofheim, Taunus, Germany (by Ilse Sofie Raizner nee Klotz, heiress); Ulfert Onken, Fischbach, Taunus, Germany; Horst Schrader, Frankfurt am Main, Germany, and Werner Wellbrock, Neuenland, Taunus, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany
Continuation of Ser. No. 54,214, July 13, 1970, abandoned. This application Aug. 1, 1973, Ser. No. 384,547
Claims priority, application Germany, July 13, 1970, 1636046
Int. Cl. C07c 41/02
U.S. Cl. 260—613 B 2 Claims

1. In a process for the manufacture of addition products of ethylene oxide and compounds containing mobile hydrogen, in which process the material to be reacted with the ethylene oxide is recycled in the course of the reaction and in which the reaction heat is abstracted by means of a tubular heat exchanger installed in the cyclic system, through the tubes of which heat exchanger the material to be reacted flows in a continuous stream, the improvement which comprises feeding the ethylene oxide in an atomized liquid state into a turbulent liquid stream of the material to be reacted and in a direction substantially perpendicular to the direction of flow of said liquid stream, passing the reaction mixture so obtained through a mixing chamber at a temperature and pressure to cause a portion of the ethylene oxide to vaporize in said chamber, and immediately thereafter passing the reaction mixture containing vapor bubbles through the tubes of said heat exchanger to remove heat of reaction therefrom.

3,894,094
HALOGENATED, TETRA-ALKYL BIPHENOLS
Thomas F. Rutledge, Wilmington, Del., assignor to ICI United States Inc., Wilmington, Del.
Filed Dec. 4, 1972, Ser. No. 311,496
Int. Cl. C07c 37/00, 49/62, 39/12
U.S. Cl. 260—620 6 Claims

1. A method of preparing a chlorinated, tetra-alkyl biphenol, said method comprising reacting a 3,3′,5,5′-tetra-C_1-C_3-alkyl diphenoquinone dissolved in a halogenated hydrocarbon with HCl, said reaction being carried out at a temperature of from about 10°C. to about the boiling point of the solvent.

3,894,095
PROCESS FOR ISOLATING ARYLHYDROXY COMPOUNDS
Siegfried Pietzsch, Kelkheim, Taunus, and Georg Schaffer, Hofheim, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany
Filed Jan. 30, 1973, Ser. No. 328,023
Claims priority, application Germany, Feb. 4, 1972, 2205227
Int. Cl. C07c 37/22, 37/24
U.S. Cl. 260—620 4 Claims

1. A process for separating and isolating arylhydroxy compounds and aqueous alkali metal hydroxide solutions from aqueous solutions of alkali metal arylates selected from the group consisting of unsubstituted phenolates and naphtholates of sodium and potassium and phenolates and naphtholates of sodium and potassium, substituted on the aromatic nucleus by alkyl, phenyl or chlorine, which comprises: extracting an aqueous solution containing the said alkali metal arylate, at a temperature in the range of from 15°C to 150°C, with a ketone selected from the group consisting of diethyl-ketone, methylisobutyl-ketone, di-n-propyl-ketone, diisopropyl-ketone, ethyl-n-butyl-ketone, methyl-tert.butyl-ketone, diisobutyl-ketone, decanone-2, acetophenone, benzophenone, cycloheptanone, isophorone, and mixtures thereof; separating the organic phase from the aqueous phase; eliminating small quantities, if any, of alkali metal hydroxide from the organic phase by washing with water; and isolating the free arylhydroxy compound from the organic phase by removing the ketone.

3,894,096
SEPARATION OF PARA-NITRATED PHENOLIC COMPOUNDS FROM CRUDE REACTION MIXTURES CONTAINING ORTHO-AND PARA-NITRATED PHENOLIC COMPOUNDS
Harvey Wade Whitten, Somerville, N.J., assignor to American Cyanamid Company, Stamford, Conn.
Continuation-in-part of Ser. No. 205,750, Dec. 7, 1971, Pat. No. 3,761,393. This application Apr. 12, 1974, Ser. No. 460,415
Int. Cl. C07c 79/24
U.S. Cl. 260—622 R 4 Claims

1. A process for recovering the para-nitrated phenolic product isomer in highly purified form from a crude reaction mixture resulting from the nitration of phenol or m-cresol, said mixture containing both para- and ortho-nitrated phenolic product isomers with the major proportion of said isomers being the para isomer, along with water and tar impurities, comprising the steps of (1) mixing the reaction mixture with toluene in a proportion of at least about 2 parts by weight of toluene per part of the reaction mixture, (2) heating the mixture formed in step 1 to a temperature of about 84°C. to extract the para and ortho isomers into the toluene, (3) further heating the mixture from step 2 at about 84°C. under reflux conditions to azeotropically distill off the water, (4) removing the insoluble tars from the hot mixture from step 3 by permitting the mixture to settle and separating the settled tars therefrom, (5) cooling the hot toluene solution from step 4 to a temperature of about 20° to 30° C. to precipitate the para isomer therefrom, (6) washing the precipitate with a small amount of fresh toluene to remove mother liquor therefrom and (7) drying the precipitate.

3,894,097
PROCESS FOR THE PREPARATION OF HEXAFLUOROISOBUTYLENE
Nicholas Vanderkooi, Jr., Pompton Plains, and Herbert J. Huthwaite, Florham Park, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.
Filed May 10, 1974, Ser. No. 468,797
Int. Cl. C07c 17/00, 21/18
U.S. Cl. 260—653.3 22 Claims

1. A process of producing hexafluoroisobutylene comprising combining a compound selected from the group consisting of acetic anhydride, acetone, acetic acid, isopropenyl acetate, acetyl acetone, diketene and mixtures thereof, with hexafluoroacetone in a reaction chamber maintained at a temperature in the range of about 340° to about 1000°C., retaining the reactants in said chamber for a residence time between about 0.1 seconds to 5 minutes whereby hexafluoroisobutylene is formed and collecting the reaction product.

3,894,098
PROCESS FOR PREPARATION OF 1-METHYLADAMANTANE
Naotake Takaishi; Yoshiaki Inamoto, both of Wakayama, and Kiyoshi Tsuchihashi, Kainan, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan
Filed June 24, 1974, Ser. No. 482,434
Claims priority, application Japan, June 27, 1973, 48-72523
Int. Cl. C07c 5/24, 13/54
U.S. Cl. 260—666 M 6 Claims

1. The process for preparing 1-methyladamantane, which comprises isomerizing 2-methyl-tricyclo[5.2.1.$0^{2,6}$]decane in the presence of an anhydrous aluminum halide catalyst in a halogenated lower hydrocarbon solvent.

3,894,099

PROCESS FOR PREPARING 1-METHYLDAMANTANE

Naotake Takaishi; Yoshiaki Inamoto, both of Wakayama, and Kiyoshi Tsuchihashi, Kainan, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Oct. 9, 1973, Ser. No. 404,195

Claims priority, application Japan, Oct. 24, 1972, 47-106514

Int. Cl. C07c *13/32*

U.S. Cl. 260—666 M 2 Claims

1. The process for preparing 1-methyladamantane, which comprises contacting (I) tricyclo[5.2.2.0^{2,6}] undecane dissolved in from 2 to 20 times by weight, based on the weight of I, of a solvent selected from the group consisting of methylene chloride, methylene bromide, chloroform, 1,2-dichloroethane, 1,2-dibromethane, 1,2-dichloropropane, 1,3-dichloropropane, 1,4-dichlorobutane, 2-methyl-1,4-dichlorobutane and chlorocyclohexane, with a catalyst selected from the group consisting of uncomplexed anhydrous aluminum chloride and uncomplexed anhydrous aluminum bromide, at a molar ratio of from 0.01 to 0.5 mole of said catalyst per one mole of I, at a temperature of −10° to +120°C, for a reaction time in the range of 1 to 20 hours until I is substantially completely transformed to 1-methyladamantane, and recovering 1-methyladamantane from the reaction mixture.

3,894,100

PROCESS FOR THE PREPARATION OF TRICYCLO (5.3.1.0.^{3,8}) UNDECANE

Naotake Takaishi; Yoshiaki Inamoto, both of Wakayama, and Kiyoshi Tsuchihashi, Kainan, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed July 2, 1974, Ser. No. 485,068

Claims priority, application Japan, July 10, 1973, 48-77621

Int. Cl. C07c *13/54*

U.S. Cl. 260—666 4 Claims

1. A process for preparing tricyclo[5.3.1.0^{3,8}]undecane which comprises isomerizing tetramethylenenorborane (I) in an inert solvent, at a temperature in the range of −30°C to 100°C, in the presence of an acid catalyst selected from the group consisting of (1) a Bronsted acid and (2) a Lewis acid in an amount of 0.01 to 0.2 mole per mole of I, terminating the isomerization reaction when the content of tricyclo[5.3.1.0^{3,8}]undecane in the reaction mixture is in the range of at least about 40 wt.%, excluding the solvent and the acid catalyst, and recovering tricyclo[5.3.1.0^{3,8}]undecane from the reaction mixture.

3,894,101

PROCESS FOR THE PREPARATION OF 1-METHYLADAMANTANE

Naotake Takaishi; Yoshiaki Inamoto, both of Wakayama, and Kiyoshi Tsuchihashi, Kainan, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed July 2, 1974, Ser. No. 485,069

Claims priority, application Japan, July 10, 1973, 48-77623

Int. Cl. C07c *5/24*

U.S. Cl. 260—666 M 6 Claims

1. The process for preparing 1-methyladamantane, which comprises isomerizing tricyclo[5.3.1.0^{3,8}]undecane in the presence of an acid catalyst.

3,894,102

CONVERSION OF SYNTHESIS GAS TO GASOLINE

Clarence D. Chang, Princeton, N.J., and Anthony J. Silvestri, Morrisville, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 9, 1973, Ser. No. 387,217

Int. Cl. C07c *1/04*, *1/20*

U.S. Cl. 260—668 R 5 Claims

1. A process comprising contacting in a first stage a mixture of carbon monoxide and hydrogen with a catalyst comprising a mixture of a methanol synthesis catalyst and an acidic dehydration catalyst at an elevated temperature up to about 700°F and such combination of conditions as to produce a first stage product comprising dimethyl ether; and contacting at least said dimethyl ether with a crystalline aluminosilicate zeolite having a silica to alumina ratio of at least about 12 to 1 and a constraint index of about 1 to 12 in a second stage at about 550° to 850°F under such combination of conditions as to produce a product the organic portion of which is predominantly liquid hydrocarbons boiling in the C_5 to 400°F range.

3,894,103

AROMATIZATION REACTIONS

Clarence D. Chang, Princeton, N.J.; Anthony J. Silvestri, Morrisville, Pa., and Robert L. Smith, Hopewell, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 9, 1973, Ser. No. 387,218

Int. Cl. C07c *1/20*

U.S. Cl. 260—668 R 7 Claims

1. In the process of converting as a reactant at least one lower aliphatic organic compound containing about 1 to 8 carbon atoms and at least one hetero constituent selected from the group consisting of oxygen, sulfur, nitrogen and halogen, by contacting such with a crystalline aluminosilicate zeolite having a constraint index of about 1 to 12 and having a silica to alumina ratio of at least about 12 at about 500° to 850°F. to produce a product comprising a highly aromatic C_5^+ gasoline boiling range liquid having a high octane number; the improvement, whereby increasing the proportion of the product which is C_5^+ gasoline, which comprises utilizing as the catalyst, a zeolite as defined having a silica to alumina ratio of about 60 to 600:1 while maintaining the other operating parameters of the process.

3,894,104

AROMATIZATION OF HETERO-ATOM SUBSTITUTED HYDROCARBONS

Clarence D. Chang, Princeton; William H. Lang, Pennington, both of N.J., and Anthony J. Silvestri, Morrisville, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 9, 1973, Ser. No. 387,219

Int. Cl. C07c *1/20*

U.S. Cl. 260—668 R 8 Claims

1. In the process for converting a feed comprising compounds of the type $(R)_n - X$, where R is a lower hydrocarbon moiety having 1 carbon atom, X is a hetero moiety selected from the group consisting of oxygen, hydroxyl, sulfur, nitrogen, halogen and cyanide and *n* is a number up to the valence of X, to other compounds having a higher ratio of R to X than in the feed by contacting such feed with a crystalline aluminosilicate zeolite catalyst, having a silica to alumina ratio of at least about 12 and a constraint index of about 1 to 12, at an elevated temperature of about 500 to about 750°F at a space velocity of about 0.1 to 50 LHSV; the improvement, whereby to produce a product which is predominantly normally liquid hydrocarbon containing a larger proportion of aromatics, which comprises utilizing as said catalyst said zeolite which has been modified by the incorporation therewith of at least one metal of Groups *Ib*, *IIa*, *IIb*, *IIIa*, *IVa* and VIII of the Periodic Table.

3,894,105

PRODUCTION OF DURENE

Clarence D. Chang, Princeton, N.J.; Anthony J. Silvestri, Morrisville, Pa., and Robert L. Smith, Hopewell, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 9, 1973, Ser. No. 387,221

Int. Cl. C07c *1/20*

U.S. Cl. 260—668 R 8 Claims

1. In the process of converting an aromatizable hetero organic compound feed to aromatic hydrocarbons by contacting such with an aluminosilicate crystalline zeolite molecular

sieve having a silica to alumina ratio of at least about 12 and a constraint index of about 1 to 12 at elevated temperatures up to about 850°F; the improvement, whereby maximizing durene production from said process, which comprises selecting a feed comprising compounds of the formula CH_3 - X wherein X is hydroxyl, alkoxy, thiol, alkylthio, amine, alkyl amine, dialkyl amine, halo or cyano; and carrying out the conversion at at least about 550°F and 20 atmospheres.

3,894,106
CONVERSION OF ETHERS

Clarence D. Chang, Princeton; William H. Lang, Pennington, both of N.J., and Anthony J. Silvestri, Morrisville, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 9, 1973, Ser. No. 387,222
Int. Cl. C07c *1/20*
U.S. Cl. 260—668 R **9 Claims**

1. A process for converting aliphatic ethers containing a hydrocarbon constituent which comprises contacting at least one aliphatic ether with a crystalline aluminosilicate zeolite having a silica to alumina ratio of at least about 12 and a constraint index of about 1 to 12 at an elevated temperature of about 500° to about 1000°F, a pressure of about 0 to 3000 psig and a space velocity of about 0.5 to 1000 WHSV under such combination of conditions as to convert said ether to a product comprising hydrocarbon compounds having a higher molecular weight than the longest hydrocarbon constituent of a respective reactant ether.

3,894,107
CONVERSION OF ALCOHOLS, MERCAPTANS, SULFIDES, HALIDES AND/OR AMINES

Stephen A. Butter, East Windsor; Anthony T. Jurewicz, Kendall Park, and Warren W. Kaeding, Westfield, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 9, 1973, Ser. No. 387,223
Int. Cl.² C07C *15/02*
U.S. Cl. 260—668 R **21 Claims**

1. In a process of condensing an aliphatic organic compound of the formula R-X where X is at least one of halogen, oxygen, sulfur or nitrogen by contacting such with a high silica to alumina ratio crystalline aluminosilicate zeolite catalyst; the improvement which comprises: utilizing a catalyst comprising such zeolite having a silica to alumina ratio of at least about 12 and a constraint index of about 1 to 12; condensing at a temperature of about 500° to 1000°F, a pressure of about 0.5 to 1000 psig and a space velocity of about 0.5 to 50 WHSV; and converting said organic compound reactant to a product comprising a complex mixture of compounds including hydrocarbon compounds having a greater number of carbon atoms than said organic compound reactant, a higher ratio of carbon atoms to hetero atoms than said organic compound reactant and a longest carbon to carbon chain length which is longer than the longest carbon to carbon chain length of said organic compound reactant.

3,894,108
HIGH TEMPERATURE LIQUID ELUTION CHROMATOGRAPHY

Paul R. Geissler, Edison, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

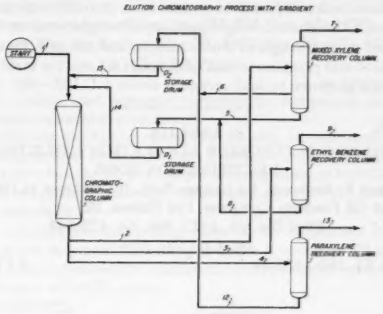
Filed Aug. 9, 1973, Ser. No. 386,948
Int. Cl. C07c *7/12*; **B01d** *15/08*
U.S. Cl. 260—674 SA **10 Claims**

1. In an elution chromatographic process conducted in a liquid phase for the separation of paraxylene and ethylbenzene from a C_8 aromatic feedstream containing ethylbenzene including the steps of:

a. contacting the feedstream mixture with a crystalline aluminosilicate adsorbent selected from the group consisting of potassium Y sieve and ammonium/potassium Y sieve;

b. passing through said bed an eluent selected from the group consisting of aromatics and substituted aromatics;

c. recovering from said bed a stream containing a portion of less preferentially adsorbed components; and



d. recovering a stream or streams substantially enhanced in concentration of paraxylene and ethylbenzene wherein the improvement comprises operating the above-described process at a temperature in the range from 160°C to 200°C, thereby reducing the overall elution volume to feed ratio and providing for the recovery of paraxylene and ethylbenzene at a reduced cost.

3,894,109
AROMATIC HYDROCARBON ISOMER SEPARATION BY ADSORPTION

Donald H. Rosback, Elmhurst, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 356,666, July 23, 1973. This application Feb. 15, 1974, Ser. No. 443,043
Int. Cl. C07c *7/12*
U.S. Cl. 260—674 SA **16 Claims**

1. A process for separating the paraisomer from a feed mixture comprising at least two bi-alkyl substituted monocyclic aromatic isomers, including the para-isomer, said isomers having from 8 to about 18 carbon atoms per molecule, which process comprises contacting said mixture with an adsorbent prepared by the steps of:

a. contacting a base material comprising X or Y zeolite with an aqueous sodium hydroxide solution at first ion exchange conditions to effect the addition of sodium cations to said base material;

b. treating the sodium-exchanged base material at second ion exchange conditions to effect the essentially complete exchange of sodium cations with barium or barium and potassium cations; and,

c. drying the material at conditions to reduce the LOI at 900°C. to less than about 10 wt. %

and thereby selectively adsorbing at adsorption conditions said para-isomer.

3,894,110
CATALYTIC DEHYDROGENATION PROCESS

Lewis E. Drehman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 15, 1973, Ser. No. 415,944
Int. Cl. C07c *5/18*
U.S. Cl. 260—680 R **3 Claims**

1. A process for the dehydrogenation of a dehydrogenatable organic compound having from 2 to 12 carbon atoms per molecule in the presence of steam and in the absence of free oxygen which comprises contacting said compound under dehydrogenation conditions with a catalyst consisting essentially of platinum, tin and cerium, each of said platinum, tin and cerium being supported on a support selected from the

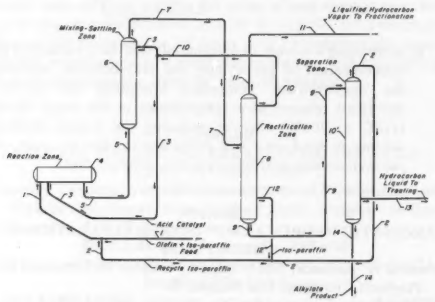
group consisting of alumina, silica, magnesia, zirconia, alumina-silicates, Group II aluminate spinels and mixtures thereof; wherein said platinum is present in said catalyst in an amount ranging from about 0.1 to about 1 weight percent; said tin is present in an amount ranging from about 0.1 to about 2 weight percent; and said cerium is present in an amount ranging from about 0.1 to about 2 weight percent, all weight percents being based on the weight of final catalyst; and wherein the mole ratio of said platinum to said tin is about 1:3 and the mole ratio of said platinum to said cerium is about 1:1.

R DK

3,894,111
HYDROGEN FLUORIDE ALKYLATION UTILIZING A RECTIFICATION ZONE

Robert F. Anderson, La Grange Park, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 26, 1973, Ser. No. 428,148
Int. Cl. C07c *3/54*
U.S. Cl. 260—683.48 **8 Claims**



1. An alkylation process which comprises the steps of:
a. reacting an isoparaffin with an olefin in contact with hydrogen fluoride catalyst at alkylation conditions in a reaction zone;
b. separating the reaction zone effluent into a hydrogen fluoride phase and a hydrocarbon phase containing hydrogen fluoride;
c. returning at least a portion of the hydrogen fluoride phase to said reaction zone;
d. passing said hydrocarbon phase to a rectification zone to separate therefrom a hydrogen fluoride stream, an isoparaffin stream and an alkylate stream containing additional unreacted isoparaffin;
e. recycling said hydrogen fluoride stream and said isoparaffin stream to said reaction zone;
f. fractionating said alkylate stream to separate unreacted isoparaffin therefrom and recycling said unreacted isoparaffin to said reaction zone; and
g. recovering the alkylate product from fractionating step (f).

3,894,112
BONDING FILM CONTAINING POLYTETRAMETHYLENEOXIDE ELASTOMERIC SEGMENTS AND POLYEPOXIDE

Warren C. Pagel, North Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Division of Ser. No. 873,132, Oct. 31, 1969, which is a continuation-in-part of Ser. No. 579,495, Sept. 15, 1966, abandoned. This application Feb. 23, 1974, Ser. No. 445,169
Int. Cl. C08g *45/00, 45/04*
U.S. Cl. 260—830 R **6 Claims**

1. A heat-curable self-supporting bonding film having a thickness between about 5 and 30 mils and consisting essentially of a single reactive layer that includes a heat-curable composition comprising (1) an epoxy resin which has on the average more than one reactive 1,2 epoxy group per molecule; (2) a high-molecular-weight flexibilizing polymer that (a) carries reactive functional groups for chemically linking the flexibilizing polymer to the epoxy resin, (b) provides 5 to 40 parts by weight of elastomeric segments in the composition for each 100 parts by weight of epoxy-resin segments; and (c) comprises sufficient molecules that have a molecular weight of at least 8,000 to account for at least about one-tenth of the weight of the composition; and (3) a room-temperature-latent curing agent active at elevated temperature to initiate reaction of the composition to an integrated cured state; said bonding film being substantially free of room-temperature-active curing agents, and being further characterized in that upon heating to an elevated temperature it (a) becomes flowable so as to wet and form a fillet on the edge portion of a honeycomb pressed against the film, and (b) subsequently cures to provide the high-strength bond necessary both (i) in a sheet-to-sheet structural member and (ii) in a sheet-to-honeycomb structural member; wherein said elastomeric segments provided by the flexibilizing polymer comprise poly(tetramethylene oxide) elastomeric segments.

3,894,113
BONDING FILM

Warren C. Pagel, North Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation-in-part of Ser. No. 579,495, Sept. 15, 1966, abandoned. This application Oct. 31, 1969, Ser. No. 873,132
Int. Cl. C08g *45/04*
U.S. Cl. 260—836 **15 Claims**

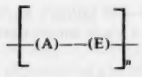
1. A heat-curable self-supporting bonding film having a thickness between about 5 and 30 mils and consisting essentially of a single reactive layer that includes a heat-curable composition comprising (1) an epoxy resin which has on the average more than one reactive 1,2 epoxy group per molecule; (2) a high-molecular-weight flexibilizing polymer that (a) carries reactive functional groups for chemically linking the flexibilizing polymer to the epoxy resin, (b) provides 5 to 40 parts by weight of elastomeric segments in the composition for each 100 parts by weight of epoxy-resin segments, and (c) comprises sufficient molecules that have a molecular weight of at least 8,000 to account for at least about one-tenth of the weight of the composition; and (3) a room-temperature-latent curing agent active at elevated temperature to initiate reaction of the composition to an integrated cured state; said bonding film being substantially free of room-temperature-active curing agents, and being further characterized in that upon heating to an elevated temperature it (a) becomes flowable so as to wet and form a fillet on the edge portion of a honeycomb pressed against the film, and (b) subsequently cures to provide the high-strength bond necessary both (i) in a sheet-to-sheet structural member and (ii) in a sheet-to-honeycomb structural member.

3,894,114
POLYAMIDE-POLYAMIDE-ACID BLOCK COPOLYMERS

Dieter Lohmann, Pratteln; Peter Furrer, Bottmingen; Roland Darms, Therwil, and Gerd Greber, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

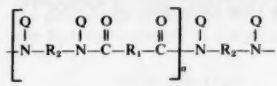
Filed Aug. 1, 1973, Ser. No. 384,643
Claims priority, application Switzerland, Aug. 25, 1972, 12656/72
Int. Cl.[2] C08G *41/04*
U.S. Cl. 260—857 PA **9 Claims**

1. Polyamide/polyamide-acid block copolymers consisting of recurring structural units of the formula I



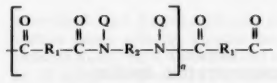
(I)

wherein *n* represents an integer from 1 to 500, A represents a polyamide block of average molecular weight 350 to 20,000 and having a base unit of the formula II or III



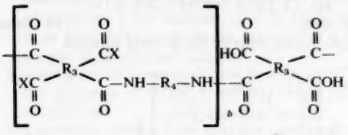
(II)

or



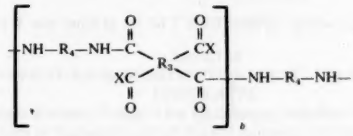
(III)

and E represents a polyamide-acid block with an average molecular weight of 750 to 20,000 and a base unit of the formula IV or V



(IV)

or



(V),

wherein *a* is an integer from 8 to 100 and *b* is an integer from 2 to 100, R_2 and R_4 independently of one another denote a monocyclic, a condensed polycyclic or uncondensed bicyclic aromatic radical in which latter radical the aromatic nuclei are linked to one another through a bridge member, or denote a heterocyclic radical, an aliphatic radical with at least two carbon atoms, a cycloaliphatic radical or an araliphatic radical, R_1 represents an aliphatic radical with at least two carbon atoms or a cycloaliphatic, carbocyclic-aromatic or heterocyclic radical, the carbonyl groups being bonded to different carbon atoms, R_3 represents a cycloaliphatic, carbocyclic-aromatic or heterocyclic radical, wherein the carbonyl groups are bonded to different ring carbon atoms adjoining one another in pairs, X denotes a hydroxyl, alkoxy or aryloxy group or a radical of the formula

and Y_1 and Y_2 independently of one another denote hydrogen or an alkyl, cycloalkyl, aryl, or aralkyl radical and the radicals

are each located on a ring carbon atom adjoining the carbonamide group and Q denotes hydrogen or an alkyl or aryl radical, and the derivatives cyclised to the corresponding polyamide-polyimide block copolymers.

3,894,115

UNSATURATED POLYESTERS HAVING HIGH IMPACT STRENGTH AND LOW WATER ABSORPTION

Robert Backai, Kensington, and John B. Wilkes, Richmond, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 323,572, Jan. 15, 1973, abandoned. This application May 20, 1974, Ser. No. 471,623

Int. Cl. C08f *21/00*

U.S. Cl. 260—861 **14 Claims**

1. An unsaturated polyester composition comprising approximately equimolar amounts of:

a. a dihydric alcohol or mixture of dihydric alcohols comprising at least 10 mol percent 3-methyl-1,5-pentanediol;

b. a dicarboxylic acid or anhydride comprising at least 20 mol percent ethylenically unsaturated dicarboxylic acid or anhydride.

7. A composition comprising from 25 to 75 percent by weight of the polyester, according to claim **1**, and from 75 to 25 of a monoethylenically unsaturated polymerizable monomer having a $>C=CH_2$ group.

3,894,116

POLYMERIZATION INITIATOR

Bernhard Hess, Kapellen near Moers, and Karl Raichle, Krefeld-Bockum, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Continuation-in-part of Ser. No. 272,758, July 18, 1972, abandoned. This application Aug. 15, 1973, Ser. No. 388,484

Claims priority, application Germany, July 21, 1971, 2136493

Int. Cl. C08f *1/16, 1/18*

U.S. Cl. 260—863 **14 Claims**

1. A polymerizable composition comprising:

A. an organic peroxide;

B. a trivalent or pentavalent compound of vanadium which is soluble in styrene, ethyl acetate, isopropanol, dimethyl formamide and monobutylphosphate to a minimum degree of 0.1% by weight, based on vanadium;

C. a compound having P—O—H acidity selected from the group consisting of an acid of phosphorus, a partial ester of such an acid or an acidic salt of such an acid or ester;

D. an α-hydroxyketone; and

E. an ethylenisally unsaturated compound or mixture of copolymerizable ethylenisally unsaturated compounds, the polymerization of which can be initiated by free radicals.

3,894,117

COMPOSITION OF POLYOLEFIN, POLYSTYRENE AND BLOCK OF SAID POLYMERS

Elias Agouri, Pau; Raymond Catte, Billere, and Jean-Louis Dauba, Pau, all of France, assignors to Aquitaine Total Organico, Paris, France

Filed Dec. 23, 1971, Ser. No. 211,667

Claims priority, application France, Dec. 29, 1970, 70.47018

Int. Cl. C08f *19/04*

U.S. Cl. 260—876 B **7 Claims**

1. A homogeneous polymer composition comprising a monoolefin polymer, polystyrene, and at least 1 polymonoolefin-polystyrene block copolymer containing 1 polymonoolefin and 1 polystyrene sequence.

3,894,118
CROSSLINKING AGENTS FOR FLUOROCARBON POLYMERS

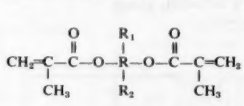
Elihu J. Aronoff, Framingham; Kewal Singh Dhami, Shrewsbury, and Tsu-Chia Shieh, Framingham, all of Mass., assignors to International Telephone & Telegraph Corporation, New York, N.Y.

Filed Jan. 21, 1974, Ser. No. 435,295

Int. Cl. C08f *29/22*

U.S. Cl. 260—884 **11 Claims**

1. A composition comprising a high temperature processing fluorocarbon polymer selected from the group consisting of ethylene-tetrafluroethylene copolymers, ethylene-chlorotrifluoroethylene copolymers, polyvinylidene fluoride homopolymers, tetrafluroethylene-vinylidene fluoride copolymers, tetrafluoroethylenehexafluoropropylene copolymers and vinylidene fluoride-hexafluoropropylene polymers, said polymer having incorporated therein a crosslinking agent for said polymer, said crosslinking agent comprising a dimethacrylate ester having the structural formula



wherein R is a radical selected from the group consisting of alkyl, cycloalkyl and aralkyl radicals, having from 5 to 14 carbon atoms; R_1 and R_2 are independently selected from the group consisting of hydrogen, alkyl, cycloalkyl, aralkyl and aryl radicals and mixtures thereof; and the total number of carbon atoms in R, R_1 and R_2 is at least 10.

3,894,119
GRAFT COPOLYMERS OF POLYSTYRENE AND POLYISOBUTYLENE

Eric Simon Forbes, Lightwater, and Ian Grieg Meldrum, Little Sandhurst near Camberley, both of England, assignors to The British Petroleum Company Limited, London, England

Filed Nov. 10, 1972, Ser. No. 305,228

Claims priority, application United Kingdom, Nov. 16, 1971, 53079/71

Int. Cl. C08f *29/12*

U.S. Cl. 260—896 **2 Claims**

1. A graft copolymer of polystyrene and polyisobutylene which consists essentially of 85 to 40% weight of a polystyrene of weight average molecular weight 50,000 to 500,000 and 15 to 60% weight of a polyisobutylene of number average molecular weight 2,500 to 20,000, the said graft copolymer being in the form of a polystyrene back-bone having each polyisobutylene group attached thereto and prepared by reacting polystyrene and polyisobutylene.

3,894,120
THERMOPLASTIC MOLDING COMPOUND COMPRISING A BLEND OF ISOTACTIC POLYBUTENES

Albert Frese; Otto Hahmann, and Horst Denzel, all of Marl, Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Germany

Filed Oct. 31, 1973, Ser. No. 411,394

Claims priority, application Germany, Nov. 4, 1972, 2254128

Int. Cl. C08f *29/12*

U.S. Cl. 260—897 A **9 Claims**

1. An isotactic polybutene-1 mixture suitable for processing into heat sealable films with good dimensional stability at high temperatures, good transparency and tear transmission resistance in both directions, consisting essentially of:

a. 10–95% by weight of a highly isotactic polybutene-1 having an RSV value of 1.7–4.5 dl/g., a density of 0.913–0.920 g./cm³, an ether-soluble content of 1–15%, a yield stress of 190–240 kp/cm², a tensile strength at rupture of 200–400 kp/cm², an ultimate elongation of 200–400% and a Vicat temperature of 115°–124° C.; and correspondingly

b. 90–5% by weight of a substantially isotactic polybutene-1 having an RSV value of 1.2–4.5 dl/g., a density of 0.890–0.910 g./cm³, an ether-soluble content of 10–30%, a yield stress of 60–150 kp/cm², a tensile strength at rupture of 160–380 kp/cm², an ultimate elongation of 300–600% and a Vicat temperature of 74°–100° C.

3,894,121
PHOSPHONITRILIC ESTERS

Rainer Wolf, Allschwil, Basel-Land, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

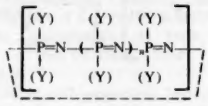
Continuation-in-part of Ser. No. 98,854, Dec. 16, 1970, abandoned. This application Oct. 11, 1973, Ser. No. 405,479

Claims priority, application Switzerland, Dec. 24, 1969, 19235/69; June 10, 1970, 8708/70

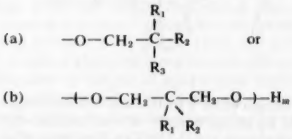
Int. Cl. C07d *105/04;* **C07f** *9/14*

U.S. Cl. 260—926 **10 Claims**

1. A phosphonitrilic ester of the general formula



where *n* is a whole number from 1 to 10; at least one Y is a radical



in which radical (*b*) *m* is 0 or 1 and when *m* is 0 the two free valencies are bound to the same phosphorus atom or are bound to two different phosphorus atoms, and each of the other Y's is halo or a radical (*a*) or (*b*); and R_1, R_2 and R_3, independently of each other, are monochloromethyl or monobromomethyl.

3,894,122
PHOSPHORUS COMPOUNDS CONTAINING AMIDE GROUPS

Walter Dursch, Schneidhain, Taunus, and Fritz Linke, Konigstein, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 29, 1973, Ser. No. 410,779

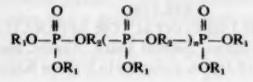
Claims priority, application Germany, Nov. 2, 1972, 2253663

Int. Cl. C07f *9/24*

U.S. Cl. 260—928 **14 Claims**

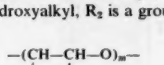
1. A compound obtained by

a. heating a compound of the formula



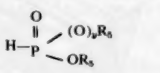
(I)

wherein n is a number from 0 to 4, R_1 is haloalkyl and hydroxyalkyl or either each with 1 to 4 carbon atoms with the proviso that at least one R_1 is haloalkyl and at least one R_1 is hydroxyalkyl, R_2 is a group of the formula



(II)

wherein R_3 and R_4 are hydrogen or haloalkyl with 1–4 carbon atoms with the proviso that at least one of the radicals R_3 and R_4 is hydrogen and m is a number from 1 to 10 with a compound of the formula



(III)

wherein y is 0 or 1 and R_5 are equal or different alkyl or alkenyl with 1 to 4 carbons; at 0° to 160°C at a pH value from 4 to 11 optionally in the presence of 0.005 to 4% by weight of an alkaline catalyst,

b. adding (meth)acrylamide and heating at 20° to 100°C in the presence of 0.005 to 4% by weight of an alkaline catalyst and

c. optionally adding formaldehyde and heating at 20° to 100°C at a pH value from 7 to 11.

3,894,123

O-ALKYL-S,S-di-(SUBSTITUTED-ALKYL)-PHOSPHORODITHIOLATES

Shigeo Kishino, Tokyo; Akio Kudamatsu, and Kozo Shiokawa, both of Kanagawa, all of Japan, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

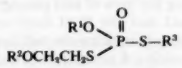
Filed Dec. 16, 1971, Ser. No. 208,938

Claims priority, application Japan, Dec. 29, 1970, 45-129545

Int. Cl. C07f *9/16;* **A01n** *9/36*

U.S. Cl. 260—941 **8 Claims**

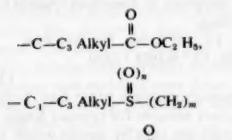
1. A compound of the formula



in which

R^1 is methyl or ethyl,

R^2 is lower alkyl of 1 to 4 carbon atoms and



Wherein n is o or 1, x is hydrogen or chloro, R_4 is hydrogen or Alkyl of 1 to 4, R_5 is alkyl of 1 to 4, cyclohexyl or benzyl.

3,894,124

S-ALKOXYETHYL-PHENYL-DI- AND -TRITHIOPHOSPHONIC ACID ESTERS

Shigeo Kishino; Akio Kudamatsu, and Shozo Sumi, all of Tokyo, Japan, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

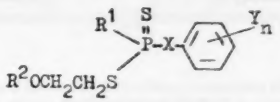
Filed Mar. 26, 1973, Ser. No. 344,799

Claims priority, application Japan, Apr. 6, 1972, 47-33844

Int. Cl. A01n *9/36;* **C07f** *9/16, 9/18*

U.S. Cl. 260—949 **9 Claims**

1. A di- or trithiophosphonic acid ester of the formula



in which

R^1 and R^2 each independently is C_1–C_6 alkyl,

X is oxygen or sulfur,

Y is C_1–C_6 alkyl, C_1–C_6 alkylmercapto or halogen, and

n is 1 or 2.

3,894,125

PHOSPHONIC ACID DITHIOL ESTERS

Ernst Beriger, Neuallschwil, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 182,126, Sept. 20, 1971, Pat. No. 3,773,862. This application Aug. 29, 1973, Ser. No. 392,574

Claims priority, application Switzerland, Sept. 28, 1970, 14322/70

Int. Cl. C07f *9/40*

U.S. Cl. 260—940 **2 Claims**

1. The compound S,S-bis-(4′-cyanobenzyl)-2-chloroethylphosphone-dithioate.

2. The compound S,S-bis-(3′-trifluoromethylbenzyl)-2-chloroethylphosphonedithioate.

3,894,126

PHOSPHORUS CONTAINING BUTADIENE-1,3-TELOMERS

Siegfried Noetzel, Kelkheim, Taunus, and Edgar Fischer, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

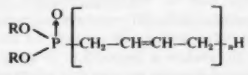
Filed June 10, 1974, Ser. No. 477,835

Claims priority, application Germany, June 12, 1973, 2329784

Int. Cl. C07f *9/40*

U.S. Cl. 260—956 **2 Claims**

1. Butadiene-1,3 telomers of the formula



where R is a lower straight-chain or branched alkyl radical having from 1 to 8 carbon atoms and n an integer of from 3 to 30.

3,894,127

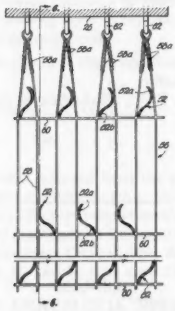
FILL ASSEMBLY STRUCTURE FOR CROSS FLOW WATER COOLING TOWER

Homer E. Fordyce, Kansas City, Mo., assignor to The Marley Company, Mission, Kans.

Division of Ser. No. 857,134, Sept. 11, 1969, Pat. No. 3,764,121. This application Feb. 12, 1973, Ser. No. 331,836The portion of the term of this patent subsequent to Sept. 11, 1990, has been disclaimed.

Int. Cl. B01f 3/04

U.S. Cl. 261—111 23 Claims



1. For use with a cross flow water cooling tower having a hot water distributor, a cold water basin therebelow, and means for incuding cross flow movement of air therebetween, the combination wherewith of splash type fill assembly structure comprising:

a series of elongated, substantially imperforate fill members each of substantially greater length than width and thickness respectively; and

means supporting the fill members in the space between the hot water distributor and said cold water basin in a plurality of horizontal, vertically spaced rows with the longitudinal axes of the fill members extending in generally parallel relationship to the direction of air flow through said space,

each of said fill members being provided with a substantially continuous major upwardly facing, longitudinally extending surface disposed for impingement of hot water thereagainst gravitating from the distributor toward the basin, said fill members being disposed in locations causing the upwardly facing major surfaces thereof to face in opposite directions in adjacent rows vertically,

the vertical spaces between each fill member and the fill members immediately thereabove and immediately therebelow respectively being substantially greater than the effective vertical height of a corresponding fill member, said major surface of each fill member being disposed at an angle less than 90° but greater than 0° with respect to the horizontal and the fill members being located in relative offset relationship with respect to members thereabove or therebelow in disposition to cause said surfaces to be disposed in water intercepting relationship throughout substantially the entire plan area of the fill assembly and in angular relationship to the general path of the gravitating hot water.

3,894,128

TRAY FOR FLUID CONTACTOR APPARATUS

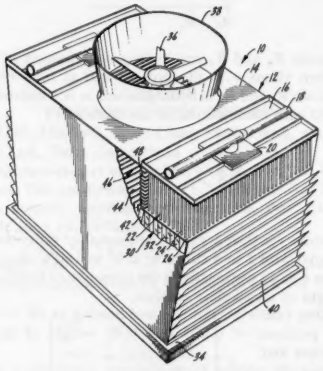
Shoichi Hirao, Kakogawa; Satoshi Ihara, Akashi, and Kanji Ueda, Ashiya, all of Japan, assignors to Seitetsu Kagaku Co., Ltd., Japan

Division of Ser. No. 116,450, Feb. 18, 1971, Pat. No. 3,807,711. This application Nov. 9, 1973, Ser. No. 414,301

Claims priority, application Japan, Feb. 27, 1970, 45-17415; Mar. 30, 1970, 45-27127

Int. Cl. B01f 3/04

U.S. Cl. 261—114 VT 7 Claims



1. A tray for fluid contacting comprising a plurality of elongated tiltable elements in the form of planar flat bars, planar, elongated, parallel supporting bars extending transversely to said flat bars for supporting said flat bars in spaced relation to one another, the supporting bars being spaced from one another and spaced intermediate the ends of said flat bars, said supporting bars having vertically oriented crosssections and further having recesses at spaced intervals therealong for receiving a portion of said flat bars, said flat bars abutting said support bars at mutual points of contact, said flat bars pivoting with respect to said support bars about said mutual points of contact so that each of said flat bars is tiltable with respect to the respective recesses to define fluid flow passages between adjacent flat bars, the flat bars being spaced from one another to define slit-like passages between adjacent bars in a load-free state and being tiltable in the same direction in a restricted range for varying the area of said passages in response to the flow rate of fluid and the fluid load conditions, the recesses in said supporting bars being shaped to allow said flat bars to pivot between a closed position in which the area of said passages is at a minimum and a maximum open position only.

3,894,129

METHOD OF MANUFACTURE OF STRAIN FREE CONTACT LENSES

Donald O. Hoffman, Sturbridge, and Edward Z. Zdrok, Webster, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Mar. 15, 1973, Ser. No. 341,614

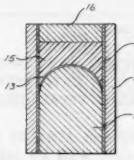
Int. Cl.² B29D 11/00

U.S. Cl. 264—1 11 Claims

1. The method of manufacturing a strain free, hydroscopic solid polymerized product suitable for contact lenses and the like which imbibes 40–80 per cent by weight water, comprising:

preparing a mixture of 20–45 percent by weight of a solid, high molecular weight polyvinyl pyrrolidone and 80–55 percent by weight of a monomethacrylate ester of a glycol selected from the group consisting of ethylene glycol and

propylene glycol, in the presence of a low temperature initiator and a medium temperature initiator, and said mixture containing not more than about 1.6 percent by weight of methacrylic acid and not more than about 1.0 percent by weight of an alkyl glycol dimethacrylate;



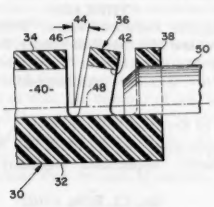
pouring said mixture in a cup-type mold;
closing said mold to exclude oxygen from said mixture;
polymerizing said mixture at a first temperature of from 40° to 60°C, and
curing said polymerized mixture at from 90°–120°C to complete the hardening of said mixture.

3,894,130

METHOD FOR PRODUCING SELF RETAINING KNOB

Thomas M. Moran, Cleveland, and Joseph H. Paskert, Lakewood, both of Ohio, assignors to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 258,965, June 2, 1972, Pat. No. 3,808,635. This application June 22, 1973, Ser. No. 372,574
Int. Cl. B29c *17/02*
U.S. Cl. 264—25 **4 Claims**



1. The method of manufacturing a molded one-piece shaft retaining device having at least a pair of axially spaced loops defining a guideway for receiving the shaft in proper axial relation to the device and a relatively resilient loop axially interposed at least two of said axially spaced loops defining an aperture partially offset said guideway through which said shaft must pass upon insertion into said guideway comprising the steps of:

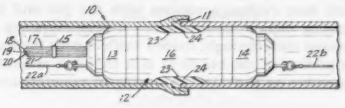
a. molding a blank having at least a pair of axially spaced loops defining a guideway and a relatively resilient loop interposed said axially spaced loops defining an aperture wherein the guideway and the aperture are axially aligned, said guideway and said aperture being molded about a substantially straight molding core;
b. removing said molding core from said blank by axially sliding said molding core out of said blank;
c. heating the blank;
d. displacing the relatively resilient loop by the application of pressure to selectively partially offset the aperture with respect to the guideway; and
e. allowing the relatively resilient loop to cool and harden in the displaced position.

3,894,131

POLY(URETHANE-UREA) SEALANTS AND SEALING UNDERGROUND STRUCTURES THEREWITH

Steven R. Speech, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Filed May 18, 1972, Ser. No. 254,527
Int. Cl. B29d *27/00*; **C08g** *22/14*; **E02d** *3/12*
U.S. Cl. 264—45.2 **9 Claims**



1. A method for sealing a structure, comprising the steps of: placing and mixing at the locus to be sealed water, a basic urea-bond forming catalyst, and a sealing composition comprising a water-miscible mixture of isocyanate-terminated prepolymers having the formula:

$$Y[(CH_2CH_2O)_n—C(O)NH—R'(NCO)_p]_z$$

where Y is the active hydrogen-free residue of a compound having a plurality of active hydrogen atoms, n is the number of oxyethylene units sufficient to make said prepolymers water-miscible, R′ is the isocyanate-free residue of a polyisocyanate, p is an integer of 1–5, and z is an integer equal to the number of active hydrogens present in said compound, said mixture containing a prepolymer of said formula having a molecular weight of about 850–1000 and a prepolymer of said formula having a molecular weight of about 1250–1550 with the average molecular weight of said mixture of prepolymers being about 1000–1300, said mixture of prepolymers being dissolved in a polar water-miscible solvent; allowing said mixture of prepolymers to react with water to form a foam; and forcing the foam into the locus to be sealed, thereby forming a poly(urethane-urea) foam seal at said locus.

3,894,132

METHOD OF FORMING COLLAGEN DISPERSIONS

Leonard Daniel, 44 Budyan Rd., Grays Point, New South Wales, Australia

Filed Sept. 10, 1973, Ser. No. 395,994
Int. Cl. A61l *17/00*; **C07g** *07/00*
U.S. Cl. 264—138 **15 Claims**

1. A method of forming a dispersion of collagenous fibres, comprising the steps of

a. treating a collagenous material with an aqueous solution of an alkaline earth metal hydroxide and an alkali metal hydroxide to reduce the cohesion between the fibres, the alkali metal hydroxide having a concentration of from 0.25 to 2 molar and the treatment being carried out at a temperature between the freezing point of the mixture and 30°C;
b. severing the collagenous material into particles containing fibres of a fibre length between about 3 and about 10 mm, and
c. mechanically dispersing the collagen fibres to free the fibres from one another substantially along their whole length and substantially without further reduction of the fibre length.

3,894,133

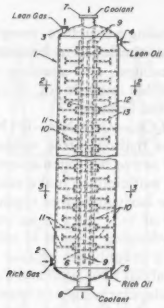
ISO-THERMAL ABSORPTION COLUMN

Angelo C. Coste, Chicago, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Oct. 19, 1973, Ser. No. 408,026
Int. Cl. B01f *3/04*
U.S. Cl. 261—153 **2 Claims**

1. A gas-liquid contacting vessel having full vertical flow heat exchange therethrough to permit substantially iso-thermal countercurrent contacting operations, which comprises in

combination, a vertically elongated confined chamber with lower fluid port means and upper port means permitting the upward vertical passage of a gaseous stream and the downward flow of a liquid stream, a substantially vertical and interiorly positioned conduit member extending through the length of said chamber, with heat exchange fluid inlet means to one end of said conduit and fluid outlet means from the other end thereof, said interiorly positioned conduit member being provided with external longitudinally disposed fin means in order to enhance heat exchange contact with the gas and liquid phases passing therearound, whereby a heat exchange fluid may be passed therethrough, spaced baffle means throughout at least a portion of the height of said chamber around said conduit member to provide intermixing of countercurrently



flowing streams while in the continuous heat exchange relationship with the latter, said spaced baffle means in said chamber comprising an alternating disc and doughnut arrangement, said disc arrangement comprising a series of discs radially extending from said fin means around said conduit member and said doughnut arrangement comprising an alternate series of doughnut-like baffle members around said fin means, said discs having weir members at the ends thereof, said baffle members having inner ring-like wall elements comprising weir means at a spaced distance from said conduit member, whereby the gas and liquid streams will necessarily be channeled back and forth across the interior portion of said vessel and effect a multiplicity of flow stream contacts with the exterior of said interiorly positioned conduit member.

3,894,134

METHOD OF MAKING REINFORCED POLYESTER SHEETS

David R. Williams, Vandergrift, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jan. 2, 1973, Ser. No. 320,006
Int. Cl. B29d *3/02*, *7/02*
U.S. Cl. 264—171 **9 Claims**

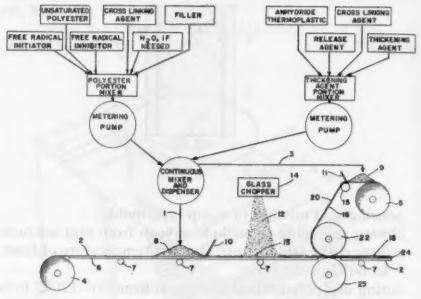
1. A method for preparing a polymerizable polyester resin mat from a polyester resin formulation by mixing different portions of the formulation comprising:

A. providing a portion of the formulation, the portion comprising an unsaturated polyester, an ethylenically unsaturated monomeric cross-linking agent capable of polymerizing with said polyester, and water, said portion being substantially stable in viscosity;

B. providing another portion of the formulation, said another portion comprising an ethylenically unsaturated monomeric cross-linking agent capable of polymerizing with said polyester, thickening agent and a thermoplastic polymer containing anhydride groups, said another portion being free of water in amounts which cause said thermoplastic polymer and said thickening agent to coact with each other thereby rendering said other portion substantially stable in viscosity;

C. preparing said formulation by separately mixing each of said portions to thoroughly distribute the ingredients thereof throughout each portion, and then mixing said portions together; and

D. promptly after mixing said portions together, forming an uncured sheet of said formulation and applying thereto fibrous reinforcements;



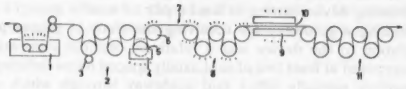
wherein said thickening agent is calcium oxide only or a mixture of calcium oxide and another thickening agent in which calcium oxide comprises at least about 80 weight percent of said mixture and wherein the amount of water and thickening agent in said formulation effects thickening thereof in a manner such that the viscosity of said formulation is sufficiently low to wet thoroughly said fibrous reinforcements and such that the formulation containing said fibrous reinforcements increases rapidly in viscosity after said fibrous reinforcements have been applied.

3,894,135

PROCESS FOR STRETCHING A CABLE OF POLYESTER THREADS

Karlheinz Riggert, Dornholzhausen; Willy Zahn, Heusenstamm; Bernhard Jantzen; Rolf Sander, both of Dornigheim, and Dietmar Wandel, Offenbach am Main, all of Germany, assignors to Zimmer Aktiengesellschaft, Frankfurt, Germany

Continuation of Ser. No. 295,166, Oct. 5, 1972, abandoned. This application Aug. 1, 1974, Ser. No. 493,557
Claims priority, application Germany, Oct. 6, 1971, 2149793
Int. Cl. B29c *17/02*
U.S. Cl. 264—290 T **8 Claims**



1. In a process for stretching a cable of polyester threads, between an inlet roller mechanism comprising a plurality of rollers and a first stretching roller mechanism, in which the stretching point is formed at the last roller of the inlet roller mechanism the improvement which comprises:

a. passing the cable while on the penultimate roller of the inlet roller mechanism through an immersion bath maintained at a temperature of 40° to 65°C;

b. maintaining the last roller of the inlet roller mechanism at a temperature 3° to 18°C higher than the immersion bath;

c. positioning the last roller higher than the penultimate roller with the angle between vertical and the cable as it rises from the penultimate roller to the last roller being less than 55° to remove fluid from the immersion bath on the cable;

d. maintaining a short residence time of less than 3 seconds for the cable between the exit point of the cable from the immersion bath and the beginning of the stretching of the cable at the last roller and,

e. stretching the cable in a stretching zone in the absence of the addition of water at a ratio of 1:25 to 1:6 to produce a cable with a low percentage unstretched fibers.

3,894,136

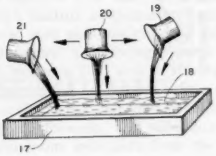
METHOD OF MAKING FREE FORM WAX DESIGNS BY CASTING WAX IN WATER

Alfred William Waddill, 16937 Willard, Van Nuys, Calif. 91406

Filed July 20, 1971, Ser. No. 164,338

Int. Cl. B29c *27/24*

U.S. Cl. 264—245 **3 Claims**



1. A method of making free form wax designs comprising the steps of: filling a shallow pan having a perimeter following a desired contour with cool water; melting a given quantity of wax sufficient to cover the area of the surface of the water in said pan to a given thickness; pouring the melted wax onto the surface of said water after the water is stationary by sweeping motions over the surface of the water following a desired path until the entire surface of the water is covered to said desired thickness, the pouring being done from a desired height above the water so that the wax penetrates the surface of the water as it strikes the surface and waiting until said wax at least solidifies to the extent that it can be removed from said pan as an integral mass of wax, the contour of said mass following that of the pan and the undersurface of the wax exhibiting a design in relief determined to a given extent by the sweeping path followed while pouring said wax into said pan and by the height above the water that the wax is poured.

3,894,137

METHOD OF DOMING PLANAR SHEETS

Theodor Peter Moench, Darmstadt, Germany, assignor to Rohm GmbH, Darmstadt, Germany

Filed Oct. 17, 1972, Ser. No. 298,458

Claims priority, application Germany, Oct. 27, 1971, 2153442

Int. Cl. B29c *25/00, 27/02*

U.S. Cl. 264—230 **10 Claims**

8. A cold-forming method for making a double-walled, domed, structural element which comprises tightly clamping two superimposed thermoplastic synthetic resin sheets along all edge portions thereof, heating only the clamped edge portions of the sheets to a temperature above the glass transition temperature of the resin to weld the sheets together in said edge portions, cooling the heated clamped edge portions slightly below the glass transition temperature of the resin, releasing the clamping, and further cooling the welded edges to room temperature, whereupon unheated central portions of said planar sheets deform to form a double-walled dome, at least one of said sheets having an aperture therein whereby the pressure between the walls of said dome and ambient pressure are equalized.

3,894,138

APPARATUS FOR MEASURING COOLANT LEAKAGE IN ELECTRICAL POWER GENERATING MACHINES

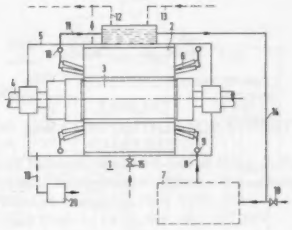
Jürgen Klaar, Mulheim-Ruhr, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim-Ruhr, Germany

Continuation of Ser. No. 304,260, Nov. 6, 1972, abandoned. This application Mar. 12, 1974, Ser. No. 450,481

Claims priority, application Germany, Nov. 5, 1971, 2159979

Int. Cl. H02k *9/24*

U.S. Cl. 310—53 **9 Claims**



1. Device for detecting cooling water leakage in the cooling water cycle of turbogenerators which are cooled by water in the stator and the rotor and are provided with additional cooling by hydrogen gas within the housing of said turbogenerator, comprising inlet means for introducing tritium into the water in the cooling water cycle, discharge means connected to said housing for withdrawal of a portion of hydrogen contained in the housing, an isotope measuring device connected to said discharge means to measure tritium which during a leakage penetrates from said cooling water cycle into said hydrogen gas contained in said housing.

3,894,139

NICKEL-COBALT SEPARATION FROM AQUEOUS SOLUTIONS

Paul H. Cardwell, Zanoni; William S. Kane, Wicomico, and James A. Olander, Gloucester Point, all of Va., assignors to Deepsea Ventures, Inc., Gloucester Point, Va.

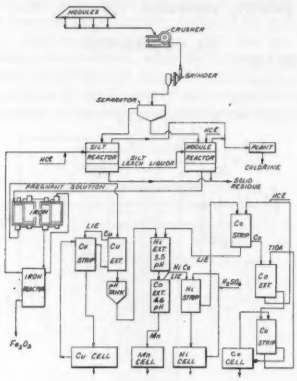
Continuation-in-part of Ser. No. 247,692, April 26, 1972. This application Feb. 28, 1973, Ser. No. 336,737

Int. Cl. C01g *3/00, 45/00, 51/00, 53/00;* **C22b** *3/00, 15/00, 23/00*

U.S. Cl. 423—24 **25 Claims**

1. A process for the separation of individual metal ions from a pregnant aqueous solution of metal salts, comprising the salts of cobalt and nickel, by extraction from an aqueous solution, followed by selective stripping, the process comprising: (1) contacting the pregnant aqueous solution with an organic solution of a liquid ion exchange agent, the agent being selected from the group consisting of alpha-hydroxyoximes and hydrocarbon-substituted-8-hydroxyquinolines, to extract both nickel and cobalt from the aqueous solution while maintaining the pH within a desired range of from about 3 to about 7 until the aqueous solution is substantially depleted in nickel and cobalt, thus forming a liquid organic extract solution containing dissolved nickel and cobalt values and an aqueous raffinate substantially depleted in nickel and cobalt; (2) selectively stripping the nickel value from the organic extract solution with an acidic aqueous solution of a mineral acid, which substantially does not strip cobalt, to form an organic phase substantially depleted of nickel and an aqueous phase containing a nickel salt; and (3) stripping the cobalt value from the organic phase using an aqueous acid solution containing a hydrogen ion and a halide ion concentration of

at least 6 Normal each so as to strip the cobalt from the extract phase so as to form a regenerated extract medium substantially depleted in nickel and cobalt values and a strongly acidic aqueous phase containing the cobalt value.



3,894,140

STABILIZATION OF ALUMINA CATALYST SUPPORTS

Abe Warshaw, Matawan, N.J., assignor to Chemical Construction Corporation, New York, N.Y.

Filed May 9, 1973, Ser. No. 358,707

Int. Cl. B01d *53/34*

U.S. Cl. 423—213.5 **17 Claims**

1. In a process for the treatment of exhaust gas from an engine to eliminate noxious components selected from the group consisting of nitrogen oxides, carbon monoxide and hydrocarbons which comprises passing an exhaust gas through at least one stage of catalysis, the improvement comprising wherein said catalysis stage contains solid catalyst particles comprising an active catalytic agent deposited on particles of transitional alumina, said active catalytic agent comprising copper, cobalt and manganese, said transitional alumina particles being stabilized by the inclusion in said transitional alumina particles of at least two metallic additives selected from the group consisting of thorium, a rare earth metal, and an alkaline earth metal, whereby a treated exhaust gas of depleted content of noxious components is discharged from said catalysis stage.

3,894,141

PROCESS FOR REMOVING NITRIC OXIDE

William R. Moser, Westfield, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Dec. 27, 1972, Ser. No. 318,875

Int. Cl. C01b *21/00*

U.S. Cl. 423—235 **7 Claims**

1. A process for removing nitric oxide from a gaseous effluent combustion waste stream deficient in oxygen, the process comprising the steps of contacting said effluent with a liquid hydrocarbon at a pressure sufficient to maintain the hydrocarbon in the liquid state, at a temperature ranging from 100° to 310°C and at a mole ratio of hydrocarbon to NO ranging from 500:1 to 0.04:1.

3,894,142

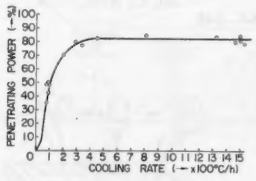
METHOD FOR PRODUCING GADOLINIUM MOLYBDATE SINGLE CRYSTALS HAVING HIGH TRANSPARENCY

Seikichi Akiyama, Kokubunji, Tokyo, and Hirotsugu Kozuka, Tokyo, both of Japan, assignors to Hitachi, Ltd., Japan

Filed July 28, 1972, Ser. No. 276,166

Int. Cl. C01g *39/00, 57/00*

U.S. Cl. 423—263 **4 Claims**



1. In a method for producing gadolinium molybdate single crystals wherein a polycrystal of gadolinium molybdate or a mixture of molybdenum oxide and gadolinium oxide blended at such a rate as to meet the stoichiometric value for forming gadolinium molybdate is heated and melted, a seed crystal is immersed in said melt and a single crystal of gadolinium molybdate is grown according to the pull method, and the resulting single crystal is cooled; the improvement which comprises the cooling of said crystal during the cooling step in the temperature zone of at least 900°C. to 700°C. at a cooling rate of over 200°C./hr.

3,894,143

PROCESS FOR THE MANUFACTURE OF CRYSTALLIZED AMMONIA PHOSPHATES

Georg Von Semel, Dortmund, and Eduard Schibilla, Dortmund-Solde, both of Germany, assignors to Friedrich Uhde GmbH, Dortmund, Germany

Filed Jan. 2, 1973, Ser. No. 320,525

Claims priority, application Germany, Feb. 2, 1972, 2204779

Int. Cl.² C01B *15/16, 25/26*

U.S. Cl. 423—313 **1 Claim**

1. A process for manufacturing ammonium phosphate comprising the steps of:

I. forming a mixture of an aqueous technical grade phosphoric acid and acetone which forms a miscible mixture with water and phosphoric acid, wherein the miscible mixture is a non-solvent for ammonium phosphate,

whereby any impurities in the technical grade phosphoric acid are precipitated,

II. separating the precipitated impurities to form a purified mixture,

III. contacting the purified mixture with ammonia to produce ammonium phosphate crystals and a supernatant liquid,

IV. separating the ammonium phosphate crystals from the supernatant liquid,

V. distilling the supernatant liquid of Step IV to separate the acetone and,

VI. recycling the acetone produced in Step V to Step I.

3,894,144

PROCESS FOR MAKING SULFATE-CONTAINING BASIC ALUMINUM CHLORIDE

Wilfried Becher, Anderten, Ub. Han., and Joachim Massonne, Hannover, both of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hannover, Germany

Filed Feb. 17, 1972, Ser. No. 227,301
Claims priority, application Germany, Feb. 19, 1971, 2107970; Dec. 22, 1971, 2163711
Int. Cl. C01b 17/46
U.S. Cl. 423—467 10 Claims

1. A process for the production of a composition of matter consisting essentially of an aqueous solution containing a substance having a chemical composition conforming to that of a sulfate-containing basic aluminum chloride having the general formula $[Al(OH)_xCl_y(SO_4)_{z/2}]_n$ in which z is a value between 0.02 and 0.3, the sum of y and z is a value between 1 and 2, and the sum of x, y and z is 3, and n is an integer of at least 1, which comprises heating together in a closed vessel at a temperature between 130° and 200°C under its own autogenous pressure a mixture of aluminum hydroxide, concentrated hydrochloric acid and concentrated sulfuric acid, the hydrochloric and sulfuric acids being present in a molecular ratio of Cl to SO_4 between 8 : 1 and 80 : 1 and the aluminum hydroxide being present in an amount that is at least equivalent stoichiometrically to that required to form a composition having the foregoing formula, and subsequently separating any unreacted aluminum hydroxide from the resulting solution.

3,894,145

PROCESS FOR DESULFURIZATION OF WASTE GAS

Minoru Morita, Tokyo; Masuo Hasegawa, Kanagawa, and Yasuhiko Kamijo, Saitama, all of Japan, assignors to Tsukishima Kikai Co., Ltd., Japan

Filed Sept. 18, 1973, Ser. No. 398,473
Int. Cl. C01b 17/04
U.S. Cl. 423—567 15 Claims

1. A process for the desulfurization of a waste gas comprising:

1. absorbing sulfur oxides contained in said waste gas with an aqueous alkali carbonate solution to form an aqueous solution containing sodium or potassium sulfite and sodium or potassium bisulfite and a desulfurized vent gas,
2. pyrolyzing said solution containing sodium or potassium sulfite and sodium or potassium bisulfite to form a pyrolysis gas product containing hydrogen sulfide and water and a pyrolysis solid product containing sodium or potassium carbonate and carbon,
3. condensing water contained in said pyrolyzed gas product to produce a condensed water solution containing at least one sulfide or hydrosulfide of sodium or potassium,
4. mixing said pyrolysis solid product with said condensed water solution whereby salts in said pyrolysis solid product are dissolved in said condensed water solution,
5. oxidizing said at least one sulfide or hydrosulfide of sodium or potassium in said condensed water solution,
6. recycling the condensed water solution containing the oxidized sulfide or hydrosulfide to absorption step 1,
7. recovering sulfur in elemental form from the hydrogen sulfide in said pyrolyzed gas product so as to produce a liquid residue containing sodium or potassium sulfur oxides and a desulfurized waste gas, and
8. recycling at least a portion of said liquid residue to pyrolysis step 2.

3,894,146

METHOD FOR PREVENTING OCCURRENCE OF DENTAL CARIES

Naoto Tsuyama, Okayama, Japan, assignor to Kabushiki-Kaisha Hayashibara Seibutsukagaku Kenkyujo, Okayama, Japan

Filed May 28, 1974, Ser. No. 474,091
Claims priority, application Japan, June 1, 1973, 48-62337
Int. Cl. A61k 7/16
U.S. Cl. 424—49 3 Claims

1. In a mouth-treatment composition containing a sweetener, the improvement wherein the sweetener contains oligoglucosyl fructose, whereby fewer dental caries will occur after use.

3,894,147

METHOD AND COMPOSITION FOR INHIBITING CALCULUS

Tayseer George Bahouth, deceased, late of Utica, N.Y., and by Zaher Bahouth, administrator, Utica, N.Y., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Mar. 2, 1973, Ser. No. 337,319
Int. Cl. A61k 7/16
U.S. Cl. 424—57 9 Claims

1. A method of inhibiting calculus formation by contacting the teeth with an effective amount of at least 0.1% of a dialkyl pyrophosphate having from about 8 to 14 carbon atoms, in the alkyl groups.

3,894,148

PROCESS FOR ENHANCING THE ENERGY METABOLISM OF AN ATHLETE

Richard E. Ecker, Hinsdale, Ill., assignor to Vitose Corporation, Clarendon Hills, Ill.

Filed Mar. 22, 1974, Ser. No. 454,011
Int. Cl.[2] A61K 31/70
U.S. Cl. 424—180 5 Claims

1. A process for enhancing the energy metabolism of an athlete whereby physical endurance is improved during competition, comprising the steps of: regulating the athlete's dietary and physical conditioning to assure substantially full glycogen storage levels at the outset of said competition; eliminating the consumption by said athlete of substantially all insulin-inducing carbohydrates for a pre-competition period of sufficient duration such that during said competition the amount of insulin within the blood of said athlete will be lowered to about minimum levels; and,

administering to said athlete, orally and during said pre-competition period, between about 10 and 50 grams of fructose.

3,894,149

PESTICIDAL CONCENTRATES

Roy Clark Mast, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed July 6, 1973, Ser. No. 376,980
Int. Cl. A01n 9/30, 9/32, 9/36
U.S. Cl. 424—200 2 Claims

1. A concentrated liquid composition comprising

From about 1 to 40 percent, by weight, of diazinon, and the balance, equal parts, by weight, of

i. ethoxylated oleyl sorbitan ester having a hydrophilic to lipophilic balance of 15, and
ii. decyldiethanol amide.

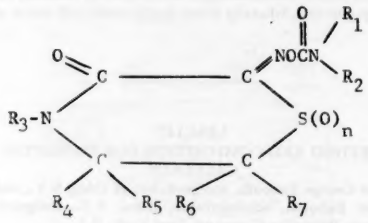
3,894,150

CARBAMATE PESTICIDAL COMPOSITIONS

John A. Durden, Jr., South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 29, 1972, Ser. No. 319,532
Int. Cl. A01n *9/00, 9/12*
U.S. Cl. 424—246 16 Claims

1. An insecticidal and miticidal composition comprising an acceptable carrier and an an insecticidally or miticidally effective amount of a compound having the structure:



wherein:

R_1 and R_2 are individually, hydrogen, lower alkyl, halo substituted lower alkyl, lower alkenyl, lower alkynyl lower alkoxyalkyl, lower alkyl thioalkyl, lower trihaloalkanesulfenyl or acyl, with the proviso that when R_1 is lower trihaloalkanesulfenyl or acyl, R_2 is hydrogen or lower alkyl;

R_3 is cycloalkyl, lower dialkylamino, lower alkoxyalkyl, lower alkylthioalkyl, furyl methyl, lower alkylcarbamoyl, carbamoyl, alkylsulfinylalkyl, alkylsulfonylalkyl or acyl;

R_4, R_5, R_6 and R_7 are individually hydrogen or lower alkyl; and

n is 0.

3,894,151

PHARMACEUTICAL COMPOSITIONS AND METHODS OF INHIBITING H-1 AND H-2 HISTAMINE RECEPTORS

James Whyte Black, Hemel Hempstead, and Michael Edward Parsons, St. Albans, both of England, assignors to Smith-Kline & French Laboratories Ltd., Welwyn Garden City, England

Filed Apr. 9, 1973, Ser. No. 349,151
Claims priority, application United Kingdom, Apr. 20, 1972, 18301/72
Int. Cl.[2] A61K *27/00*
U.S. Cl. 424—246 19 Claims

1. A pharmaceutical composition having H-1 and H-2 histamine receptor inhibiting activity which comprises about 30 mg. to about 250 mg. of an antihistamine, said antihistamine being a compound which inhibits those histamine receptors inhibited by mepyramine, about 50 mg. to about 500 mg. of an H-2 histamine receptor inhibitor, H-2 histamine receptors being those histamine receptors which are not inhibited by mepyramine but are inhibited by burimamide, and a pharmaceutically acceptable diluent or carrier, wherein said H-2 histamine receptor inhibitor is a compound selected from the group consisting of N-methyl-N′-[4-(4(5)-imidazolyl)butyl] thiourea, N-[4-(4(5)-imidazolyl)butyl]thiourea, N-methyl-N′-[4-(4-bromo-5-imidazolyl)butyl]thiourea, N-methyl-N′-[2-((4-methyl-5-imidazolyl)methylthio)ethyl]thiourea and N-methyl-N′-[2-((4-imidazolyl)methylthio)ethyl]thiourea.

3,894,152

USE OF (THIENYL-3)(3-N-MORPHOLINE-PROPY)KETONE

Andre Lucien Adrien Pons; Max Fernand Robba, both of Paris; Rene Henri, Espins, and Pierre Marcy, Sartrouville, all of France, assignors to Innothera, Val de Marne, France

Division of Ser. No. 72,496, Sept. 15, 1970, abandoned. This application Apr. 23, 1973, Ser. No. 353,362
Claims priority, application France, Sept. 15, 1969, 69.31306
Int. Cl.[2] A61K *27/00*
U.S. Cl. 424—248 1 Claim

1. A process for the treatment of a patient to induce a neuroleptic, tranquilizing or analgesic effect which comprises administering to the patient 50 to 500 mg of (thienyl-3) (3-N-morpholino-propyl) ketone and a pharmaceutically acceptable diluent.

3,894,153

METHOD OF MEDICAL TREATMENT OF ASTHMA

Shinro Yamamoto, Saitama, Japan, assignor to Eisai Co., Ltd., Tokyo, Japan

Filed Oct. 30, 1973, Ser. No. 411,095
Claims priority, application Japan, Nov. 2, 1972, 47-110058
Int. Cl. A61k *27/00*
U.S. Cl. 424—331 5 Claims

1. A method of treating asthma which comprises administering orally to a human suffering from asthma, from 2.5 to 50 mg of menaquinone per day.

3,894,154

CENTER-FILLED GUM

Allan H. Graff, Hartsdale, and Wayne J. Puglia, Floral Park, both of N.Y., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jan. 14, 1974, Ser. No. 432,921
Int. Cl. A23g *3/00, 3/30*
U.S. Cl. 426—5 9 Claims

1. A chewing gum piece comprising an enclosed cavity formed in said gum piece, and a liquid fill in said cavity; said liquid fill including an aqueous solution having a dissolved solids portion, and glycerin for retarding increases in viscosity of said liquid fill.

3,894,155

PROCESS FOR THE PREPARATION OF A FROZEN DOUGH FOR BAKERY PRODUCTS

Shoji Ono, Ohi-Machi; Ikuo Kitamura, Kawagoe; Tomoko Kuramoto, Tokyo; Keizaburo Taguchi, Fukuoka, and Tomozo Yoshizaki, Tokyo, all of Japan, assignors to Nisshin Flour Milling Co., Ltd., Tokyo, Japan

Filed Oct. 23, 1973, Ser. No. 409,000
Claims priority, application Japan, Dec. 8, 1972, 47-122439
Int. Cl. A21d *8/04, 2/04, 2/22*
U.S. Cl. 426—25 8 Claims

1. A process for the preparation of a frozen dough for bakery products, which comprises:

a. fermenting a dough containing 1% or less by weight, based on the flour in said dough, of active yeast to form a punchable fermented dough;

b. cooling the fermented dough to 2°–15° C. to suppress yeast fermentation activity;

c. admixing 2–6% by weight, based on the flour in said dough, of additional yeast with the cooled dough; and

d. freezing the resultant admixture while said additional yeast is in the stage of dormancy or induction.

3,894,156

METHOD FOR MASHING

Lars Karl Johan Ehnstrom, Tullinge, and Zigurds Sviestins, Enskede, both of Sweden, assignors to Alfa-Laval AB, Tumba, Sweden

Filed Apr. 12, 1973, Ser. No. 350,639

Claims priority, application Sweden, Apr. 13, 1972, 4774/72

Int. Cl. C12c 7/04

U.S. Cl. 426—29 3 Claims

1. In the mashing of a finely divided raw material into a liquid for the production of wort, the method comprising the steps of passing said liquid through an enclosed path having a constricted portion, creating an underpressure in the path at the region of said constricted portion, subjecting the finely divided raw material to a cyclone separating operation to form a fine dispersion of said material in air, and causing said dispersion to be sucked into said path at a point where said underpressure prevails, thereby forming a suspension of said material in the liquid.

3,894,157

COLOR STABILIZATION IN FREEZE-DRIED CARROTS WITH ASCORBIC AND ERYTHORBIC ACIDS

Danny M. Gottlieb, and Jack R. Linaberry, both of Modesto, Calif., assignors to General Foods Corporation, White Plains, N.Y.

Filed June 4, 1973, Ser. No. 366,956

Int. Cl. A23b 7/04, 7/10

U.S. Cl. 426—268 5 Claims

1. Process of stabilizing color in dehydrated carrots which comprises decorticating carrots, subdividing them into sliced and diced form, blanching and cooking the resulting carrot pieces, infusing a solutions of an acid selected from the group consisting of ascorbic, erythorbic and salts thereof into the pieces, freezing the pieces and freeze drying the frozen pieces to a stable moisture content.

3,894,158

MANUFACTURE OF EDIBLE COLLAGEN CASINGS USING LIQUID SMOKE

Albert T. Miller, Somerville, N.J., assignor to Devro, Inc., Somerville, N.J.

Filed Apr. 24, 1973, Ser. No. 354,053

Int. Cl. A22c 13/00

U.S. Cl. 426—277 6 Claims

1. The process of manufacturing an edible collagen casing by the steps comprising: incorporating liquid-smoke into an extrusion mass of acid-swollen collagen, the amount of liquid-smoke used being 0.01 to 2.0 parts for each part of collagen solids in said extrusion mass; extruding said liquid-smoke containing acid-swollen collagen extrusion mass into the shape of a casing; and drying the resultant edible collagen casing.

3,894,159

METHOD FOR FILLING THE CAVITY OF AN EDIBLE SHELL WITH A CONFECTIONERY FILLING

Rudolf Franta, Breitenbrunn, Austria, assignor to Rondo-Neisse Susswarenindustrie Gesellschaft m.b.H., Breitenbrunn, Austria

Continuation of Ser. No. 212,273, Dec. 27, 1971, abandoned. This application Feb. 26, 1974, Ser. No. 446,115

Claims priority, application Austria, Dec. 31, 1970, 11768/70

Int. Cl. A23g 3/00, 3/20

U.S. Cl. 426—284 4 Claims

1. A method of mechanically filling the cavity of an open edible tubular wafer with a melted confectionery filling whose solidification point at atmospheric pressure is no lower than normal room temperature, comprising the steps of supercooling the melted filling under superatmospheric pressure to a temperature below the solidification point thereof, and essentially horizontally injecting the supercooled filling through a jet nozzle into the cavity of the tubular wafer at the superatmospheric pressure while maintaining the tubular wafer in an essentially horizontal position whereby the filling solidifies in the cavity.

3,894,160

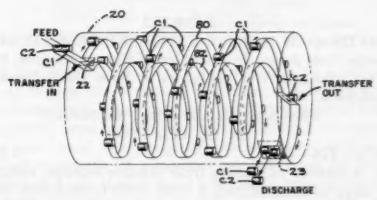
METHOD OF PROCESSING TWO LINES IN A SINGLE PASS COOKER

Harry E. Barney, Jr., Santa Clara, and Rodney A. Engdahl, Campbell, both of Calif., assignors to FMC Corporation, San Jose, Calif.

Division of Ser. No. 292,001, Sept. 25, 1972, Pat. No. 3,815,490. This application Oct. 25, 1973, Ser. No. 409,485

Int. Cl. B65b 55/06

U.S. Cl. 426—407 2 Claims



1. The method of processing two separate lines of containers in a multi-pass rotary cooker of the type having a horizontal axis outer shell with an internal spiral, an inner shell with an external spiral, and a rotating container advancing reel between the shells; comprising the steps of feeding a first line of containers through an end zone of the outer shell and into its spiral while radially confining the containers between circumferentially extending portions of the reel and the outer shell, simultaneously feeding a second line of containers through an adjacent end zone of the outer shell past the associated end of the reel and into the inner shell spiral while radially confining the containers between circumferentially extending portions of the reel and the inner shell, simultaneously advancing both lines of containers along their respective spirals by the reel, discharging the first line of containers through the outer shell at a zone that is a convolution away from the end of the outer spiral, transferring the second line of containers past the other end of the reel and into the outer spiral, and discharging the second line of containers through the outer shell from the end of the outer spiral.

3,894,161

METHOD OF PROTECTING STORED SUGARBEETS AND AN ARTICLE USEFUL THEREFOR

Walter R. Akeson, Longmont, Colo., assignor to The Great Western Sugar Co., Denver, Colo.

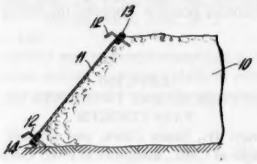
Filed Oct. 18, 1972, Ser. No. 298,525

Int. Cl. A23l 1/00

U.S. Cl. 426—419 2 Claims

1. A method of protecting a pile of sugarbeets stored outside on the ground comprising covering at least the sides of the pile down to about 5 feet from the ground level with a plurality of mats at least 8 days after the pile was formed and after the ambient temperature has dropped to between about 40° and about 50° F., and covering the remainder of the pile down to ground level when the temperature has dropped to below about 40° F., said mats being formed of woven strips of polypropylene and having at least one rigid member attached to the upper and lower ends thereof, the mats being disposed on the pile so that the longitudinal dimensions thereof are generally parallel to the fall line of the pile sides and so that adjacent mats overlap along the longitudinal margins thereof, securing

the upper and lower ends of the mat to the pile by passing stakes through the rigid members, wrapping the overlapping



longitudinal margins of adjacent mats about at least one longitudinal rigid member to the pile by passing stakes therethrough.

3,894,162

METHOD OF MAKING FRESH SKINLESS SAUSAGE

Edward Cole Jones, Jr., and Gerald Robert Johnson, both of Fort Atkinson, Wis., assignors to Jones Dairy Farm, Fort Atkinson, Wis.

Filed Sept. 26, 1974, Ser. No. 509,459
Int. Cl. A22c *11/00*
U.S. Cl. 426—442 **8 Claims**

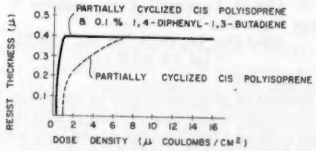
1. A method of making fresh skinless sausage, comprising the steps of comminuting a fresh meat formulation, stuffing the fresh meat formulation into a water permeable casing, linking the casing at intervals throughout its length to provide a series of uniform links, reducing the temperature of the linked product to below 32°F to freeze the product and provide a frozen bond between the casing and said meat formulation, wetting out the casing by contacting the casing with water for a period of time sufficient to cause said water to penetrate the casing and melt the frozen bond between the meat formulation and the casing while maintaining the meat formulation in a substantially frozen state, and peeling the wetted out casing from the frozen meat formulation to provide fresh skinless sausage links.

3,894,163

ADDITIVES TO NEGATIVE PHOTORESISTS WHICH INCREASE THE SENSITIVITY THEREOF

Barret Broyde, Decatur, Ga., assignor to Western Electric Company, Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 122,121, March 8, 1971, abandoned, which is a division of Ser. No. 764,866, Oct. 31, 1968, abandoned. This application Mar. 26, 1973, Ser. No. 344,796
Int. Cl.² B44D *1/50*; C08F *236/08*
U.S. Cl. 427—43 **2 Claims**



1. A process for generating a pattern on a substrate comprising:

coating said substrate with a uniform thin film of a composition comprising (a) a partially cyclized cis-polyisoprene and a solvent therefor, and (b) 1,4-diphenyl-1,3-butadiene, present in an amount ranging from 0.1 to 5% of said partially cyclized cis-polyisoprene and solvent;

exposing areas of said substrate desired to be protected to sufficient electron beam radiation to crosslink and insolubilize the thin film on said areas;

dissolving and removing the areas of said thin film not radiated; and

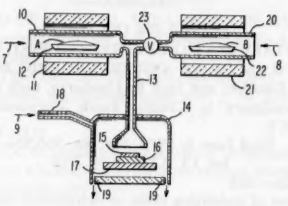
etching, plating or oxidizing the now-exposed portions of said substrate.

3,894,164

CHEMICAL VAPOR DEPOSITION OF LUMINESCENT FILMS

John Pickett Dismukes, Princeton, N.J., and James Kane, Affoltern am Albis, Switzerland, assignors to RCA Corporation, New York, N.Y.

Filed Mar. 15, 1973, Ser. No. 341,597
Int. Cl.² B44D *1/02*; C23C *11/02*
U.S. Cl. 427—70 **8 Claims**



1. A method for depositing a luminescent film comprising

a. vaporizing into a nonreactive carrier gas at least one $M(thd)_3$ beta-diketonate and at least one $Ln(thd)_4$ beta-diketonate, wherein M is at least one member of the group consisting of yttrium, lanthanum, gadolinium, and lutetium, Ln is at least one lanthanide selected from the group consisting of dysprosium, erbium, holmium, neodymium, praseodymium, samarium, terbium and thulium, and (thd) is a tetramethylheptanedionate radical,

b. mixing with said vapor-laden carrier gas a reactant gas selected from the group consisting of vanadium-containing betadiketonates, hydrogen sulfide, sulfur vapor, and carbon sulfide,

c. contacting the vapor-laden carrier gas mixture with a substrate that is heated to temperatures in the range of 400° to 750°C until the substrate is coated with said luminescent film,

d. and then lowering the temperature of said substrate to room temperature.

3,894,165

COATED FLEXIBLE RETICULATE STRUCTURES AND METHOD FOR THE PREPARATION THEREOF

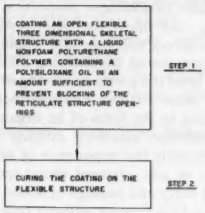
Lester W. Bates, Newark, Del., assignor to G. S. Staunton & Co., Inc., Royal Oak, Mich.

Filed May 23, 1973, Ser. No. 362,905
Int. Cl. B44d *1/44*
U.S. Cl. 427—244 **6 Claims**

1. The method for forming a rigid reticulate structure which comprises:

a. coating a core of a reticulate flexible three dimensional skeletal structure having openings between strands which form the structure with a liquid non-foam polyisocyanate derived polymer formed by mixing a polyisocyanate and a polyol having a hydroxyl number between 100 and 1,000 immediately prior to coating and which cures to a thin coating and containing in admixture therewith between about 0.1 and 10 parts by weight of polysiloxane oil per 100 parts by weight of the polyol so as to thinly coat

the strands with polyurethane polymer witout blocking the openings between the strands; and


COATING AN OPEN FLEXIBLE THREE DIMENSIONAL SKELETAL STRUCTURE WITH A LIQUID NONFOAM POLYURETHANE POLYMER CONTAINING A POLYSILOXANE OIL IN AN AMOUNT SUFFICIENT TO PREVENT BLOCKING OF THE RETICULATE STRUCTURE OPENINGS
STEP 1
CURING THE COATING ON THE FLEXIBLE STRUCTURE
STEP 2

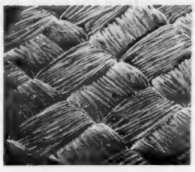
curing the polyurethane polymer coating to a rigid condition.

3,894,166

INTEGRAL REVERSE OSMOSIS MEMBRANE WITH HIGHLY PRESSED WOVEN FABRIC SUPPORT MEMBER

Barry M. Brown, and Walter D. Slowig, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 21, 1972, Ser. No. 282,219
Int. Cl.[2] B44D *1/092*
U.S. Cl. 427—316 **5 Claims**



1. In a process for manufacturing semi-permeable integral cellulosic film membranes suitable for use in reverse osmosis processes, which process comprises the steps of

a. casting in the form of a film a concentrated cellulosic dope onto an elongated, permeable, casting and membrane support fabric;

b. exposing said film to a gaseous atmosphere for a sufficient period of time to develop an incipient active layer at the surface of the resulting partially evaporated layer of dope exposed to said gaseous atmosphere;

c. thereafter diverting the elongated fabric on which is coated said layer of dope into water to thereby cause said partially evaporated layer of dope to gel and form a wet membrane; and

d. thereafter removing the resulting wet membrane and fabric from said bath as a substantially nonseparable semipermeable laminate, said concentrated dope being comprised of a blend of at least one cellulosic film-former selected from the group consisting of soluble film-forming cellulose esters, ethers and mixed ester ethers and at least one pore-producing material; said blend being dissolved in a volatile, water miscible solvent portion in which said fabric is insoluble;

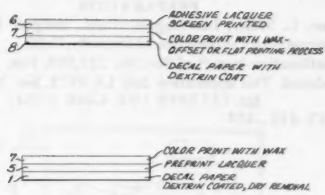
the improvement therein being where the fabric comprises substantially unsized warp and fill strands of substantially continuous multifilaments of fiber-forming crystalline organic thermoplastic resin, said fabric being heat pressed to render it substantially completely free of interstices at the strand intersections, and the solvent consists essentially of an effective amount of acetic acid, formic acid, or a mixture of acetic and formic acids.

3,894,167

DECALCOMANIA FOR DECORATING CERAMIC WARE

Karl-Heinz Kluge, Mainz, and Alfred Eppich, Zirndorf, both of Germany, assignors to F. Xavier Leipold, Zirndorf, Germany

Filed Apr. 24, 1972, Ser. No. 246,964
Int. Cl.[2] B44C *1/16*
U.S. Cl. 428—40 **10 Claims**



1. A decalcomania suitable for application to a ceramic substrate at high rate consisting essentially of a carrier layer, an overlying decal layer containing vitrifiable pigment and a thermoplastic resin, and an agent for facilitating the separation of said decal layer from said carrier layer, said agent consisting essentially of a member selected from the group consisting of a wax in said decal layer and a preprint lacquer layer between said decal layer and said carrier layer, said preprint lacquer layer containing a quantity of oil effective for facilitating said separation said wax being selected from the group consisting of polyethylene and polyethylene glycol.

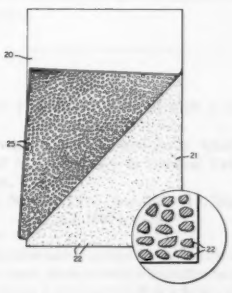
10. A decalcomania suitable for application to a ceramic substrate at high rate consisting essentially of a carrier layer permeable to water and coated with dextrin or glue, an overlying decal layer containing vitrifiable pigment, wax, and a thermoplastic resin, and a finishing layer containing thermoplastic resin overlying said pigment-containing decal layer, said carrier being detachable from said decal layer by wetting said carrier subsequent to attaching said decalcomania to a substrate by heating.

3,894,168

PAPER COATING PIGMENT MATERIAL

Bruce W. Brockett, and Robert E. Miller, both of Dayton, Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Apr. 30, 1971, Ser. No. 139,118
Int. Cl.[2] B41M *5/12*
U.S. Cl. 428—514 **21 Claims**



3. A dry, free-flowing, powder comprising particulate material consisting of water-insoluble, chemically neutral, paper-coating pigment particles a substantial portion of which have

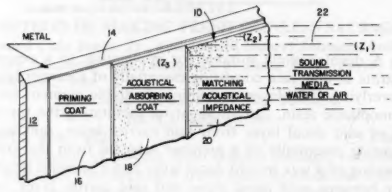
adsorbed thereon an acid-colorable, water-insoluble, chromogenic, substantially colorless dye-precursor material.

13. A record sheet having a base web coated with water-insoluble, chemically neutral, paper-coating, mineral particles of minute size at least part of the particles having adsorbed thereon a water-insoluble, chromogenic, substantially colorless basic dye-precursor.

3,894,169
ACOUSTICAL DAMPING STRUCTURE AND METHOD OF PREPARATION

Darrow L. Miller, Los Angeles, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 227,590, Feb. 18, 1972, abandoned. This application July 13, 1973, Ser. No. 379,043
Int. Cl.[2] E04B *1/84;* **G10K** *11/04*
U.S. Cl. 428—425 **18 Claims**



1. An acoustical damping structure effective over a wide frequency range comprising a substrate containing a composite coating, said composite coating consisting essentially of two coatings one positioned over the other, one of said coatings being a sound absorbing coating, said sound absorbing coating formed of an elastomer matrix containing particles of an inorganic filler in sufficient proportion such that said matrix containing said filler particles substantially completely absorbs sound waves entering said sound absorbing coating from an adjacent sound transmitting medium, said particles being selected from the group consisting of metal and siliceous particles, the other of said coatings being an impedance matching coating in the form of an organic polymeric material, said impedance matching coating being designed to match approximately the impedance of said sound absorbing coating to that of said adjacent sound transmitting medium, and permitting entry and passage of sound waves through said impedance matching coating without reflection and into said sound absorbing coating for absorption therein, said inorganic filler particles being present in a proportion of about 10 to about 50 percent by volume of said elastomer-filler particles mixture, and including said inorganic particles in said polymeric material of said impedance matching coating, in a proportion of from 0 to about 20 percent by volume of said polymeric material-filler particles mixture, said elastomer matrix of said sound absorbing coating being silicone elastomer, polyurethane, soft rubber, butyl rubber, buna or polyalkyl acrylates having alkyl groups of from 4 to 10 carbon atoms, said polymeric material of said impedance matching coating being silicone, polyurethane, soft rubber, butyl rubber, buna rubber elastomers, acrylic or epoxy resins, said metal particles being selected from the group consisting of aluminum, magnesium, beryllium, brass, nickel, copper, molybdenum, lead and tungsten particles, and said siliceous particles being selected from the group consisting of quartz, glass, borosilicate glass and porcelain powders.

ELECTRICAL

3,894,170
COMBINED INSULATING STRIP AND ELECTRICAL CONDUCTOR AND CONDUCTOR SUPPORT ASSEMBLY INCLUDING THE SAME

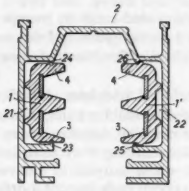
Hartmut Schinzel, Munchberg, Germany, assignor to Rehau-Plastiks GmbH, Rehau, Germany

Filed Dec. 20, 1973, Ser. No. 426,540

Claims priority, application Germany, Dec. 20, 1972, 7246552

Int. Cl. H01r *9/00;* **H02g** *5/04;* **B60m** *1/34*

U.S. Cl. 174—99 B **12 Claims**



7. In a conductor support assembly including: a carrier member having wall means that define a longitudinally extending holding channel; an insulating strip made of a hard synthetic material and having parallel spaced outer legs and a base interconnecting the legs, the base having a thickness and a reverse face and the outer legs having an external face, the legs and a portion of the strip base extending therebetween defining a longitudinally extending receiving channel; and a conductor held in the receiving channel of the insulating strip; the strip being inserted in and coextensively with the holding channel of the carrier member with the legs of the insulating strip oriented outwardly from the holding channel; the improvement comprising in combination:

a. a longitudinally extending rib provided on said reverse face centrally with respect to said receiving channel, said rib extending outwardly from said reverse face for increasing said thickness and being oriented toward said wall means of said carrier member;

b. oppositely oriented rib-like projections provided on said wall means of said carrier member and extending away therefrom; and

c. locking means provided on the external face of each said outer leg interlocking with each said rib-like projection and retaining said insulating strip in the holding channel of said carrier member.

9. In an assembly including a longitudinal, conductor-supporting insulating strip made of a hard synthetic material and having longitudinally extending parallel spaced outer legs and a base interconnecting the legs, the base having a thickness and a reverse face and the outer legs having an external face, the legs and a portion of the strip base extending therebetween defining a longitudinally extending receiving channel; and a conductor held entirely within the receiving channel of the insulating strip, the improvement comprising in combination:

a. a longitudinally extending rib provided on said reverse face centrally with respect to said receiving channel, said rib extending outwardly from said reverse face for increasing said thickness; and

b. locking means provided on the external face of said outer legs for interlocking with lateral rib-like projections of a holding channel in which said insulating strip is insertable.

3,894,171
ELECTRICAL TRANSFORMERS

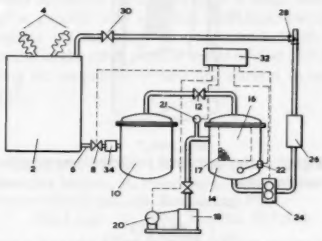
Roland Gregor Paul Kusay, Blechingley, England, assignor to The British Oxygen Company Limited, London, England

Filed Nov. 20, 1973, Ser. No. 417,559

Claims priority, application United Kingdom, Nov. 23, 1972, 54199/72

Int. Cl. H01b *9/06;* **B01d** *19/00, 39/00*

U.S. Cl. 174—14 R **2 Claims**



1. An oil insulated electrical transformer including a casing having an outlet permanently communicating its interior with vacuum degassing apparatus for treatment of the oil while the transformer is live, means for feeding oil to the degassing apparatus, and returning treated oil to the interior of the casing, either continually or intermittently, the degassing apparatus including a compartment containing packed column fillers over which the oil can flow in thin films, said compartment being connected to a vacuum pump, a control unit operatively connected between the compartment and vacuum pump to turn the vacuum pump on when the pressure in the compartment is above a chosen maximum; and to turn the pump off when the pressure is below a chosen minimum, a valve located at the outlet of the casing and controlling flow of oil from the interior of the casing, said control unit opening the valve when the contamination in the oil in the casing reaches a chosen level, and a second valve located at the inlet of the casing and controlling the flow of treated oil toward the interior of the casing.

3,894,172
MULTICABLE TELEPHONE CABLE IN A COMMON SHEATH

Ludwik Jachimowicz, Elizabeth, and Jerzy Adam Olszewski, Edison, both of N.J., assignors to General Cable Corporation, Greenwich, Conn.

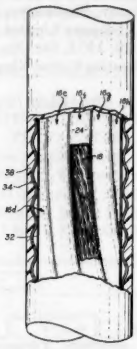
Filed Nov. 6, 1973, Ser. No. 413,206

Int. Cl. H01b *11/00*

U.S. Cl. 174—34 **10 Claims**

1. A communication cable including in combination a number of conductor pairs, each of which includes two conductors twisted together along a course which is a helix, and each pair having the pitch of its helix different from that of the other pairs, the helix differences being greater than 0.15 inch, means holding the pairs bundled together in a unit, a conducting shield around the unit, a plurality of like units shielded

from one another by their respective shields and cabled together to form a core for the cable, and a common enclosure



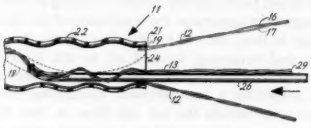
surrounding all of the units and holding them together in the communication cable.

3,894,173

METHOD OF APPLYING TELEPHONE PAIR IDENTIFICATION SLEEVE, SLEEVE, AND REELED CABLE COMPRISING SAME

Franklin D. Andrews, Eden, N.C., assignor to The Anaconda Company, New York, N.Y.

Filed July 24, 1974, Ser. No. 491,579
Int. Cl. H01b *7/36;* **H02g** *15/04;* **G09f** *3/00*
U.S. Cl. 174—74 R **14 Claims**



1. The method of identifying a defective pair in a sheathed telephone cable comprising a plurality of helically cabled conductor pairs and having at least one defective pair, comprising the steps of:

A. removing a portion of the sheath from an end of said cable,

B. providing a tubular sealing cover having a selected length closed at one end, for said cable,

C. providing a smooth flexible sleeve for identifying said defective pair, said sleeve comprising a wall defining a notch at a selected distance along the length thereof opening into said sleeve,

D. inserting an end of said defective pair into one end of said sleeve, withdrawing said end of said defective pair radially through said notch and leaving a portion of said sleeve free from said defective pair,

E. while holding said end of said defective pair taut, gripping said free portion and therewith urging said sleeve into the sheathed portion of said cable along the helix of said defective pair, to a depth exceeding said length of said cover,

F. cutting said pairs and said sleeve at a section substantially flush with a cut end of said sheath, and

G. fitting and fastening said cover over said sheath thereby sealing said end of said cable.

3. A plastic sleeve for insertion into a cable around a helically stranded telephone pair comprising a tubular wall of polymeric material, said wall defining a close fitting passageway for said pair, said sleeve being tapered at one end thereof, said wall comprising a notch defining an opening therethrough for said pair said notch sloping radially outwardly away from the tapered end of said sleeve, said sleeve being sufficiently stiff for insertion into said cable by means of a force applied to said sleeve on a portion remote from said notch and said sleeve being sufficiently flexible to follow the helix of said pair.

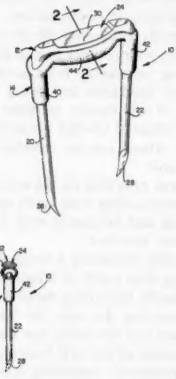
9. A coil of sheathed telephone cable comprising a large plurality of insulated conductor pairs, of said pairs at least one being selected for marking, tubular covers sealing both ends of said cable and extending over said cable for substantial distances at said ends, polymeric sleeves having notches within said cable at both ends thereof, portions of said sleeves covering said selected pair forward of said notches and portions of said sleeves being free from said pair rearward of said notches, said sleeves extending to the ends of said cable and said portions of said sleeves covering said selected pair forward of said notches being within said cable and extending beyond the distances covered by said covers.

3,894,174

INSULATED STAPLE AND METHOD OF MAKING THE SAME

Walter P. Cartun, Avon, Conn., assignor to Emhart Corporation, Hartford, Conn.

Filed July 3, 1974, Ser. No. 485,426
Int. Cl. H01b *17/00;* **F16b** *15/00;* **B21g** *7/02*
U.S. Cl. 174—159 **10 Claims**



1. A method of making an insulated staple comprising the steps of:

providing a U-shaped body member having two spaced and generally parallel legs and a bridging section connected to one end of each leg opposite the spaced, free ends of the legs, the free ends being pointed;

providing a flexible tube formed from an insulating material and having a predefined length between the axial ends of the tube less than the combined lengths of the two paral-

lel legs and the bridging section of the body member, and greater than the length of the bridging section alone;

piercing the pointed, free ends of the parallel legs on the body member through one side wall of the tube into the hollow tube interior at an intermediate portion of the tube between the opposite end portions of the tube;

bending the flexible tube into a U-shaped configuration with the opposite end portions of the tube substantially in alignment with the parallel legs of the body member respectively; and,

then forcing the parallel legs of the body member and the end portions of the bent tube relative to one another to slide the end portions of the tube coaxially onto the respective legs of the body member.

8. An insulated staple for anchoring objects to a base comprising:

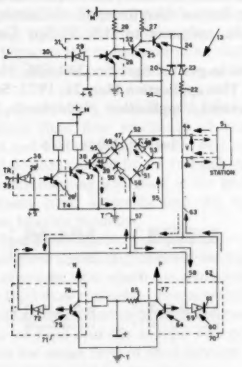
a generally U-shaped body member having substantially parallel legs, each leg being pointed at its free end for penetration into a support, and a bridging section joining the legs; and

a non-metallic, flexible tube bent in a U-shaped configuration and mounted on the U-shaped body member with opposite end portions of the tube positioned coaxially on the respective legs of the body member, completely encircling the portions of the respective legs adjacent the bridging section and exposing the ends of the legs, the tube also including an intermediate portion having a tubular cross section connecting the end portions and extending under the bridging section between the legs to line a substantial part of the inner periphery of the U-shaped body member and to provide a double layer of insulation between the bridging section and a captured object.

3,894,175
LINE CONTROL UNIT FOR TELEPRINTERS

Giovanni Zaffignani, Ivrea, and Oscar Mannocchi, Torino, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Torino), Italy

Filed Nov. 16, 1973, Ser. No. 416,571
Claims priority, application Italy, Dec. 22, 1972, 71041/72
Int. Cl. H04l *25/02*
U.S. Cl. 178—2 R **3 Claims**



1. A line control unit for connecting a teleprinter to a transmission line comprising:

a switching circuit for defining different operation modes of the teleprinter by means of a pair of command signals,

a first combination of said pair of signals (L=0, TR=1) indicating a local operation mode, a second combination (L=1, TR=0) of said pair indicating a request for transmission mode,

an actuating circuit for modulating the amplitude of the electrical current flowing on said line from a first value to a second value according to the mode indicated by said couple of signals, and

a pair of optoelectronic coupling circuits for supplying said actuating circuit with a pair of control signals associated with said pair of command signals and for providing an electrical isolation between said switching circuit and said actuating circuit, wherein said actuating circuit comprises:

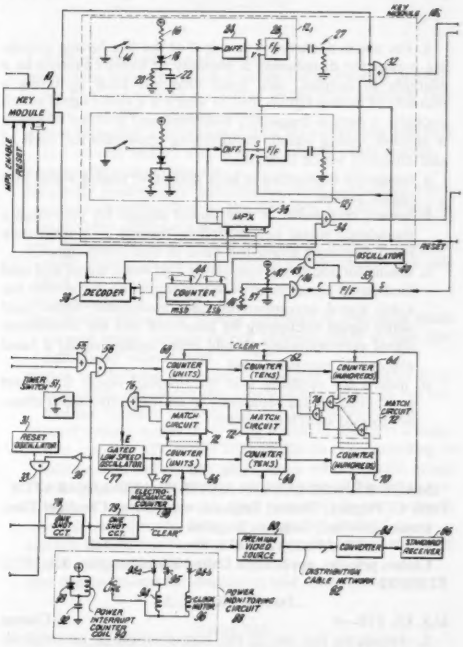
a first electronic switch disposed in series with said line through a resistor and having a control input via one of said pair of optoelectronic coupling circuits responsive to one control signal of said pair of signals for modulating the amplitude of said line current to said first value,

a second electronic switch disposed in series with said line and in parallel with said first electronic switch and responsive via the other of said optoelectronic coupling circuits to the other control signal of said pair for modulating the amplitude of said line current to said second value.

3,894,176
PREMIUM VIDEO DISTRIBUTION SYSTEM

Regis Benedict Mellon, St. Petersburg, Fla., assignor to Digital Communications, Inc., St. Petersburg, Fla.

Filed Apr. 19, 1974, Ser. No. 462,581
Int. Cl. H04n *1/44*
U.S. Cl. 178—5.1 **10 Claims**



1. In combination in a key monitoring system, a plurality of key securing lock switches, each having electrical contacts exhibiting a closed or open state depending upon the presence of an associated key thereon, lock switch contact monitoring means connected to said lock switch contacts for supplying an output pulse when a key is removed from any of said lock switches, multiplex means having plural inputs connected to said lock switch electrical contact monitoring means, addressing means connected to said multiplex means for serially

gating onto a multiplexed output port the state of said plural lock switch electrical contacts, disjunctive logic means for providing an output responsive to an output of either said key removal pulse supplying means or an output of said multiplexing means, and key counting means for counting the outputs of said disjunctive logic means.

3,894,177

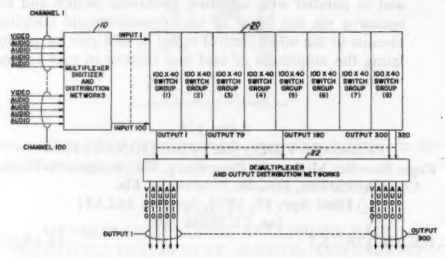
SIGNAL DISTRIBUTION SYSTEM

Norman E. Howell, Russell G. Thompson, and Eric R. Woods, all of San Diego, Calif., assignors to General Dynamics, St. Louis, Mo.

Filed Mar. 23, 1973, Ser. No. 344,374

Int. Cl.[2] H04N 7/00

U.S. Cl. 178—5.6 **8 Claims**



1. For use in a television terminal or the like having switching means for distributing a plurality of input channels to a plurality of outputs, said input channels each including a plurality of analog signals, one of which is a video signal which occupies a certain frequency baseband and another of which is another analog signal, multiplexing apparatus for each of said channels which comprise:

a. means for converting at least said other analog signal into digital signals,

b. means responsive to said digital signals for providing a modulated signal corresponding thereto in a frequency band displaced above the band of said video signal,

c. means for additively combining said video signal and said modulated signal to provide a multiplexed signal with the video signal accompanying said modulated signal, said video signal occupying its baseband and the modulated signal corresponding to said other analog signal a band above said baseband, and

d. means for applying said multiplexed signal from said combining means separately in its respective input channel to said switching means.

3,894,178

IMAGE REPRODUCTION METHOD AND APPARATUS

Peter C. Pugsley, Pinner, England, assignor to Crosfield Electronics Limited, London, England

Filed Nov. 13, 1973, Ser. No. 415,428

Claims priority, application United Kingdom, Nov. 13, 1972, 52351/72

Int. Cl. H04n 1/38

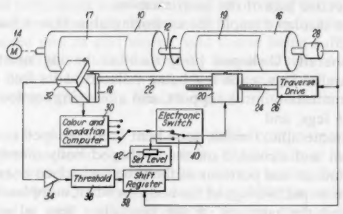
U.S. Cl. 178—6 **6 Claims**

1. Apparatus for use in the reproduction of an original, comprising a first scanning head including first photo-electric means for scanning an original, element by element, with a first aperture to provide a signal representing the density values of successively scanned elements on the original image, the image-representing signal constituting a control signal for a scanning image-reproduction device, the apparatus additionally comprising:

a second scanning head including second photo-electric means for scanning the said original with a second aperture larger than the first aperture and covering an area of the original larger than the element scanned by the first scanning head, the second scanning head being arranged to precede the first scanning head in the scanning of the original;

means responsive to a signal on said second photo-electric means having a value distinguishable from the image-representing signals to generate a replacement control signal;

replacement means responsive to a replacement control signal to replace an image-representing signal for a scanned element of the original by a signal having a predetermined value;



and a delay device to delay the operation of the replacement means in response to a distinguishable signal from the second photo-electric means, corresponding to an area scanned by the second scanning head, until the output of the first photo-electric means represents the density value of an element within said area;

whereby when defects in the original are so painted that they result in a distinguishable signal from said second photo-electric means, the signal of predetermined value constitutes the control signal for the scanning image-reproduction device for said element and the defects are omitted from the reproduction.

3,894,179

METHOD OF MANUFACTURING AN INFORMATION CARRIER

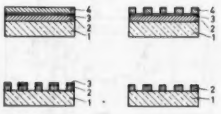
Bernardus Antonius Johannus Jacobs; Johannes Van Der Wal, and Gerrit Berend Gerritsen, all of Emmingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 344,636, March 26, 1973, abandoned. This application Mar. 26, 1973, Ser. No. 344,865

Claims priority, application Netherlands, Sept. 5, 1972, 7212045

Int. Cl. H04n 5/76

U.S. Cl. 178—6.6 R **8 Claims**



1. Method of manufacturing a disk-shaped information carrier provided with a substantially spiral information track, comprising the steps of coating a disk-shaped information carrier with an etchable base material having a predetermined height, coating the base material with a relatively thin metal layer, coating the metal layer with a photoresist, rotating the disk relative of a point source of radiation, in particular the beam of radiation emitted by a laser, intermittently exposing the photoresist for variable periods which correspond to the

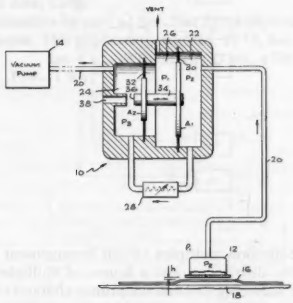
information, developing the photoresist, and etching the photoresist and exposed portions of the metal layer and base material.

3,894,180

HEAD HEIGHT CONTROL SYSTEM

Lawrence S. Canino, Los Angeles, Calif., assignor to MCA Disco-Vision, Inc., Universal City, Calif.

Filed Nov. 5, 1973, Ser. No. 413,165
Int. Cl. G11b *7/12, 15/64, 21/20*
U.S. Cl. 178—6.6 R **22 Claims**



1. For use with an information handling system in which a transducer head assembly and a surface of an information bearing medium are immersed in fluid and are relatively movable with respect to each other to form a dynamic fluid bearing therebetween, a combination for maintaining a predetermined spacing between the transducer head assembly and the surface of the information bearing medium, said combination comprising:

a first fluid flow restricting conduit, said first conduit having predetermined fluid flow resistance characteristics and having first and second end portions, said conduit having its first end portion carried by the transducer head assembly and communicating with fluid in the spacing between the transducer head assembly and the surface of the information bearing medium;

a source of fluid at a variable controllable pressure;

a second fluid flow restricting conduit having a fluid flow resistance characteristic which has a predetermined relation to the fluid flow resistance characteristic of said first conduit, said second conduit being intercoupled between said source of fluid and the second end portion of said first conduit for series flow of fluid through said first and second conduits to said source; and

control means for controlling fluid pressure of said source, said control means being coupled to said first conduit and to said source of fluid and responsive to changes in fluid pressure in first conduit for varying the fluid pressure of said source to vary the fluid flow rate through said first and second conduits,

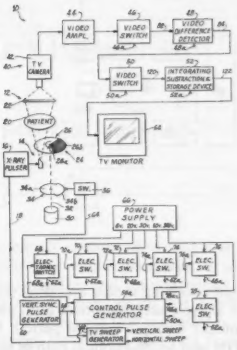
whereby changes in transducer head spacing are automatically corrected by varying flow rate through said first and second conduits in response to the corresponding pressure changes in the first conduit.

3,894,181

DIFFERENTIAL ENHANCEMENT OF PERIODICALLY VARIABLE IMAGES

Charles A. Mistretta, and Michael G. Ort, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed June 14, 1973, Ser. No. 369,824
Int. Cl. H04n *7/18*
U.S. Cl. 178—6.8 **14 Claims**



1. Differential imaging apparatus,

comprising image producing means for alternately producing first and second sequential image with identical portions and differential portions,

means including a television system for converting said first and second images into first and second video signals,

a video difference detector,

means for sequentially supplying said first and second video signals corresponding to the first and second images to said video difference detector,

said detector being operative to produce a first differential video signal corresponding to the difference between said first and second video signals,

an image storage device,

first writing means for writing an image in a positive sense on said image storage device corresponding to said first differential video signal,

means for deriving a second differential video signal from said video difference detector corresponding to the difference between said second and first video signals,

second writing means for writing a second image in a negative sense on said image storage device corresponding to said second differential video signal whereby said image storage device additively integrates the differential portions of said differential video signals while subtractively combining the non-differential portions thereof,

reading means for reading the integrated image stored in said image storage device,

and display means for displaying said integrated image.

3,894,182

PICTURE REPRODUCING APPARATUS

Manabu Yamamoto, Odawara; Akira Hashimoto, Ohme, and Hideyuki Horiuchi, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 27, 1973, Ser. No. 391,838
Claims priority, application Japan, Aug. 25, 1972, 47-84547
Int. Cl. H04n *1/04*
U.S. Cl. 178—7.6 **6 Claims**

1. In a picture reproducing apparatus including a light beam source, a light modulating device positioned to modulate the

intensity of said light beam from said light beam source in correspondence with a predetermined video signal, and light receiving means for receiving the light beam modulated by said light modulating device, the improvement comprising optical path control means arranged between said light modulating device and said light receiving means for directing said modulated light beam along a first optical path to said light receiving means during a period for reproducing the video

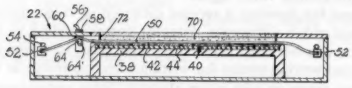
signal on said light receiving means and directing said modulated light beam along a second optical path away from said light receiving means during a retrace period, light detector means arranged on said second optical path of said modulated light beam for detecting the intensity of said modulated light beam in said second optical path, and input adjustment means for adjusting the operating point of said light modulating device in response to the output of said light detector means.

3,894,183

STYLUS ACTUATED ELECTRICAL DEVICES

Benjamin J. Barish, 29 Benzalel St., Tel Aviv, Israel

Continuation of Ser. No. 265,985, June 26, 1972, abandoned. This application July 22, 1974, Ser. No. 490,682
Claims priority, application Israel, June 30, 1971, 37197
Int. Cl. G08b 5/22
U.S. Cl. 178—18 **11 Claims**



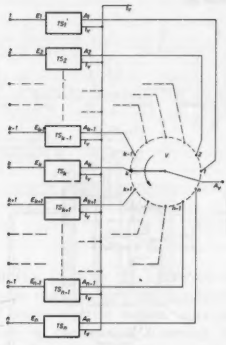
1. An electrical switching device comprising a supporting member carrying at least one electrically conductive element, and a flexible sheet member carrying at least one electrically conductive element placeable on top of the supporting member with the two conductive elements facing each other, at least one of said members including a coating of insulating material to insulate the conductive elements from each other when the flexible sheet member is placed on top of the supporting member, said insulating coating being of a soft, pressure-flowable material which parts under the pressure of a stylus upon the application thereof to the flexible sheet member to thereby bring the two conductive elements into contact with each other, said insulating coating also being tacky to hold the two conductive elements in contact with each other upon removing the pressure of the stylus, the flexible sheet member being separable from the supporting member to interrupt said contact.

3,894,184

TIME DIVISION MULTIPLEX SUBSCRIBER CIRCUIT

Herbert Aulhorn, Leonberg, and Harry Schulz, Stuttgart, both of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 8, 1974, Ser. No. 458,634
Claims priority, application Germany, Apr. 27, 1973, 2321469
Int. Cl. H04l 5/00
U.S. Cl. 178—50 **5 Claims**



1. In a time-division-multiplex circuit arrangement including a transmitter-distributor, and a source of multiplex clock rate pulses and incoming dial and teleprinter character signals, a time-division-multiplex subscriber circuit comprising:

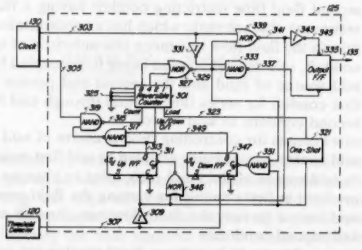
means for bit-wise transfer of the teleprinter character and dial signals according to a counting code and into the transmitter-distributor cycle, said transfer means including a buffer for storing the signals at the multiplex clock rate and with a delay, and a counting device for counting the clock rate pulses and ending the setting of the buffer after the counting device has reached a predetermined counting value, whereby said counting value is determined by the direction of the change of polarity of said signals at the beginning of counting.

3,894,185

DIGITAL RUN LENGTH SYNCHRONIZER

Bruno J. Vieri, Dallas, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 6, 1974, Ser. No. 448,592
Int. Cl. H04l 7/00
U.S. Cl. 178—69.5 F **7 Claims**



1. Apparatus for converting an asynchronous binary input signal into a binary output signal having transitions synchronous with a clock signal comprising

memory means responsive to a first transition of said input signal and pulses of said clock signal for storing an indication of the time displacement between said first transition and a succeeding clock pulse,

means initiating an output signal synchronous with a clock pulse when said stored displacement is greater than a predetermined amount,

means responsive to a second transition of said input signal for controlling said memory means to decrement said stored indication by the time displacement between said second transition and a succeeding clock pulse, and

means terminating said output signal synchronous with a clock pulse when the decremented indication is less than said predetermined amount.

3,894,186

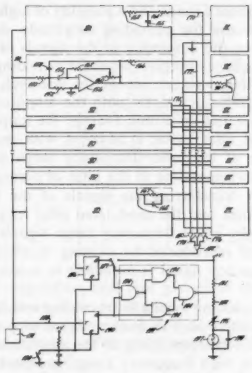
TONE ANALYSIS SYSTEM WITH VISUAL DISPLAY

Thomas D. Humphrey, Silberado, and John H. Humphrey, Los Angeles, both of Calif., assignors to Sound Sciences Inc., Santa Ana, Calif.

Continuation-in-part of Ser. No. 299,189, Oct. 20, 1972, abandoned. This application Aug. 30, 1973, Ser. No. 393,033

Int. Cl.[2] G09B *15/02;* **G10L** *1/00*

U.S. Cl. 179—1 SA **3 Claims**



1. A device for identifying sound waves having different frequencies which comprises:

sound wave responsive means;

means comprising filters for separating waves of different frequencies appearing at the output of the sound wave responsive means;

means activated by said wave separating means for individually and visually identifying the sound waves; and

means for indicating relative conformity of said waves with the center frequency of the filters by comparing the phase of said waves at the input and output of said filters.

3,894,187

CIRCUIT FOR COMPARING AT LEAST TWO INPUT SIGNALS TO GENERATE CONTROL SIGNALS

Shinichi Shibata, and Takashi Saeki, both of Tokyo, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kanagawa-ken, Japan

Filed Oct. 31, 1973, Ser. No. 411,200

Int. Cl. H04m *1/60;* **H01h** *47/02*

U.S. Cl. 179—1 HF **10 Claims**

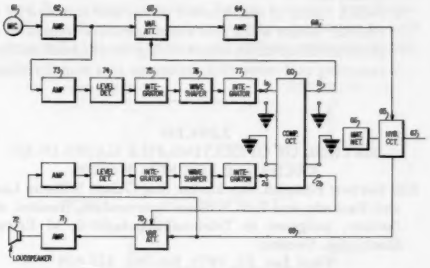
1. A loud-speaking telephone system including:

detecting means for detecting, transmitting and receiving voice signals;

transmitting and receiving variable attenuators; and,

circuit means for comparing signals detected by said detecting means to generate control signals for said variable attenuators,

said circuit means comprising first and second input terminals connected to said detecting means, first and second output terminals connected to said attenuators, a first



transistor circuit connected to said first input terminals and to said first output terminals, a second transistor connected to said second input terminals and said second output terminals, first means for turning said second transistor off when said first transistor is conductive, and second means for turning said first transistor off when said second transistor is conductive, whereby the respective amounts of attenuation of said attenuators are controlled in accordance with said control signals.

3,894,188

REMOTE CONTROL DEVICE FOR AN AUTOMATIC TELEPHONE ANSWERING APPARATUS

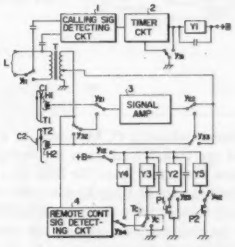
Akira Konno, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. Nos. 213,616, Dec. 29, 1971, abandoned, and Ser. No. 247,648, April 26, 1972, abandoned. This application Jan. 16, 1974, Ser. No. 433,636

Claims priority, application Japan, Dec. 30, 1970, 45-127693; Apr. 30, 1971, 46-29312

Int. Cl. Ho4m *1/64*

U.S. Cl. 179—6 E **14 Claims**



1. A remote control device for use with an automatic telephone answering apparatus, including a tape transport mechanism having a magnetic recording tape and a record/playback head for playing back previously recorded messages, said device comprising:

a. a remote control signal detecting means coupled to said answering apparatus for detecting a predetermined control signal,

b. counter means driven by said tape transport mechanism to count in a forward direction when said tape is advanced during either recording or playback modes and to

count in a decreasing direction when said tape is reversed in a rewind mode,

c. reset means controlled by the initiation of said control signal detected by said detecting means for resetting said counter means to a predetermined initial count,

d. mode control means operable in response to the detection of said control signal by said detecting means for putting said tape transport mechanism in a rewind mode and to put said tape transport mechanism in a playback mode, and

e. switch means in said counter means and actuated by said counter means when said counter means returns to said predetermined initial count during the playback mode for returning said answering apparatus to a standby state.

3,894,189

METHOD OF OPERATING FILE GATES IN AN EXCHANGE FOR PCM WORDS

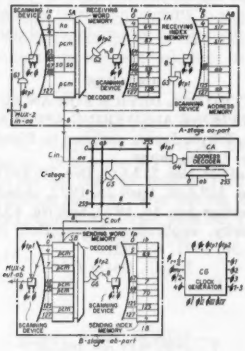
Nils Herbert Edstrom, Stockholm; Stig Gustaf Wilhelm Lindqvist, Enskede, and Erik William Sparrendahl, Handen, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Jan. 22, 1973, Ser. No. 325,639

Claims priority, application Sweden, Feb. 8, 1972, 1443/72

Int. Cl. H04q *11/04*

U.S. Cl. 179—15 AT **3 Claims**



1. In an exchange wherein PCM words in a time divison multiplex format are transferred from incoming transmission links to a first time stage and from the first time stage, during time slots, on files via a space stage to a second time stage and hence to outgoing transmission links a method for operating the file gates of the exchange comprising the steps of dividing each time slot into two parts, transmitting to an address register in the space stage during the first part of a time slot an address allotted to one of the files outgoing from the space stage, transmitting to the space stage during the second part of a time slot the actual PCM word, storing in said address register said address and decoding the contents of said address register to generate one of a plurality of control signals, each of said control signals being associated with a particular address during the respective time slot, and activating, by means of the generated control signal an associated file gate which connects the file on which the address and the PCM word have been transmitted to the outgoing file identified by the address.

3,894,190

SYSTEM FOR TRANSFERRING WIDE-BAND SOUND SIGNALS

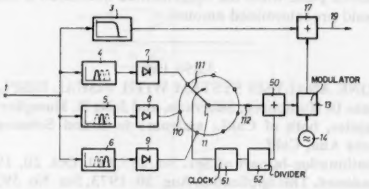
Gerhard Günter Gassmann, Berkheim, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 30, 1974, Ser. No. 438,124

Claims priority, application Germany, Feb. 28, 1973, 2309987; Apr. 26, 1973, 2321230

Int. Cl. H04j *3/18*

U.S. Cl. 179—15.55 R **17 Claims**



17. A system for transferring wide-band sound signals over a narrow frequency range, comprising:

a transmitter including means for receiving the sound signals, means for dividing the received sound signals into a lower frequency range and a plurality of higher frequency ranges, means for providing amplitude signals corresponding to the amplitude of the signals of each of the higher frequency ranges, means for providing at least one pilot frequency signal, means for positively modulating the pilot frequency signal with the amplitude signals in such a way that on a time average the amplitude of the modulated pilot signal is lowered with respect to the amplitude of the lower frequency range signals by an amount corresponding to the limit of perceptibility, and means for transferring the signals of the lowered frequency range and the modulated pilot frequency signal whereby the lower frequency range signals may be received and reproduced by existing receivers while the pilot frequency signal is inaudible in existing receivers; and

a receiver including means for receiving and demodulating the modulated pilot frequency signal to provide amplitude signals corresponding to the amplitudes of the signals in the high frequency range, means for providing synthetic signals having frequencies approximately equal to the mid-range frequency of each higher frequency range, means for modulating each synthetic signal with the appropriate amplitude signal, and means for receiving and reproducing the modulated synthetic signals and the directly transferred low frequency range signals.

3,894,191

SCANNER EMPLOYING SEQUENTIALLY ACCESSIBLE MEMORY

Dennis Joseph Sassa, Englishtown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 21, 1974, Ser. No. 499,122

Int. Cl.[2] H04M *3/22*

U.S. Cl. 179—18 FG **1 Claim**

1. In a traffic service position system having a plurality of trunks and a plurality of operator positions,

a first plurality of scan points respectively associated with said plurality of operators' positions and each indicating service request information for the position associated therewith;

a second plurality of scan points respectively associated with said plurality of trunks over which calls are instituted by the conveyance thereover of digits in the form of groups of pulses, each of said second plurality of scan

points indicating the on- or off-hook state of the trunk associated therewith;

a sequentially accessible memory storing a first plurality of words respectively associated with said plurality of positions and storing a second plurality of words respectively associated with said plurality of trunks, said memory comprising

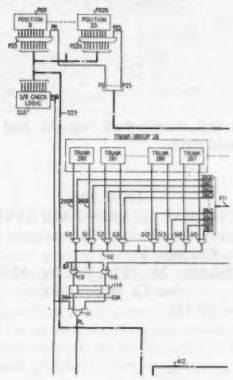
a first group of shift registers storing prior state information specifying the state of each of said positions and trunks at each of two previous interrogations thereof,

a second group of shift registers storing timing information associated with pulse, interdigit, and disconnect timing,

a third group of shift registers storing pulse count information specifying the number of pulses in each group of pulses received over said trunks,

a fourth group of shift registers storing information specifying whether each call is in a pulse-disconnect timing mode or an interdigit timing mode,

said words stored in said memory including information in each of said groups of shift registers;



means for controlling said four groups of shift registers to output said words in sequential order;

means for interrogating each said scan point concurrent with the outputting of the word associated therewith from said memory; and

logic means jointly responsive to the state of an interrogated scan point and to said output word associated with said interrogated scan point for generating reports indicating either

1. seizure of the trunk associated with said interrogated scan point,
2. the end of a digit received over the trunk associated with said interrogated scan point and the number of pulses therein,
3. release of the trunk associated with said interrogated scan point, or
4. a service request from an operator's position associated with said interrogated scan point.

3,894,192
DX SIGNALING CIRCUIT

Otto G. Wisotzky, San Francisco, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed July 29, 1974, Ser. No. 492,666
Int. Cl. H04m *7/10*
U.S. Cl. 179—18 AH **10 Claims**

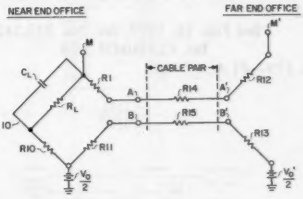
1. In a telephone signaling system, appartus for detecting the polarity of signaling voltages applied over a cable pair, and said apparatus comprising:

an input port having terminals (A and B) for connection to a cable pair;

a first resistor and a capacitor connected in parallel having a terminal (**10**) at one end, and terminal (M) at the other end, and the parallel combination having an impedance (Z_{RC});

a second resistor of resistance (**R1**), having one end connected to said terminal (A), and the other end connected to said terminal (M);

first means providing first and second voltage generators, said first voltage generator having a source impedance (**R10**) and having an output terminal connected to said terminal (**10**), and said second voltage generator having



a source impedance (**R11**) and having an output terminal connected to said terminal (B);

second means having only two inputs and one output, providing a voltage summation of the voltages appearing on the inputs, one input connected to said terminal (A), and the second input connected to said terminal (**10**);

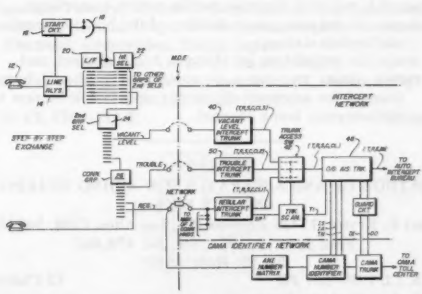
third means having only two inputs and one output, providing a voltage summation of the voltages appearing on said inputs, one input connected to said terminal (M), and the second input connected to said terminal (B); and

fourth means determining the voltage difference between only two inputs, one input connected to the output of said second means and the other input connected to the outut of said third means.

3,894,193
TELEPHONE INTERCEPT APPARATUS

Hari Keshav Puranik, Milan, and James Lawrence Stepan, Humboldt, both of Tenn., assignors to International Telephone & Telegraph Corporation, New York, N.Y.

Filed May 15, 1974, Ser. No. 470,054
Int. Cl. H04m *3/52*
U.S. Cl. 179—27 FG **5 Claims**



1. An intercept apparatus for a multiple exchange network comprised of at least one step-by-step exchange and centralized intercept equipment and apparatus coupled to the plural leads of a terminal of a final switch in said step exchange for providing intercept service for calls directed to said terminal, said apparatus including means for connecting certain of the leads from said terminal directly to equipment for forwarding

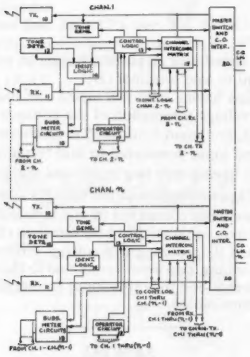
said call from said exchange toward said intercept equipment, and other means interposed in another one of said leads from said terminal directed toward said equipment in which said final switch includes means for switching through a call and a guard means both connected to said one other lead, said interposed means preventing operation of said switch-through relay and permitting operation of said guard relay on the occurrence of a call to said terminal whereby to prevent ring current being sent to said terminal.

3,894,194

AUTOMATIC MOBILE RADIO TELEPHONE SYSTEM

Edward G. Frost, 12000 Old Georgetown Rd., Rockville, Md. 20852

Filed Feb. 16, 1973, Ser. No. 333,142
Int. Cl.[2] H04M *5/08*
U.S. Cl. 179—41 A **45 Claims**



27. A mobile station for use in a radio telephone system employing multiple communication channels via each of which said mobile station is capable of transmitting and receiving radio signals, said mobile station having a home channel on which it receives calls, said mobile station being characterized in that it is adapted for use in areas where its home channel is not available, said mobile station comprising:

means for detecting unavailability of the home channel of said mobile station;

means for establishing an alternate home channel; and

tuning means responsive to unavailability of said home channel for automatically tuning said mobile station to said alternate home channel.

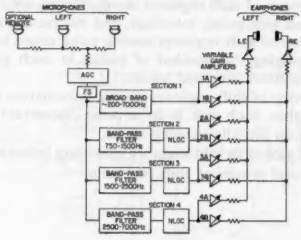
3,894,195

METHOD OF AND APPARATUS FOR AIDING HEARING AND THE LIKE

Karl D. Kryter, 13725 Robleda Rd., Los Altos, Calif. 94022

Filed June 12, 1974, Ser. No. 478,462
Int. Cl. H04r *25/00*
U.S. Cl. 179—107 FD **12 Claims**

1. A method of aiding hearing, that comprises, adjusting the over-all intensity level of speech signals with substantially linear gain over a predetermined range of intensities; applying the adjusted-intensity signals along a plurality of frequency filtering paths, one passing a broad band of the speech signal frequencies, and the others passing successive adjacent narrow bands within said broad band; reducing separately in each of the other paths, the dynamic range of intensity levels corresponding to segments of speech signals that vary in intensity for brief moments in the corresponding narrow bands, as distinguished from the more steady state segments of background noise and steady-state signals; and combining the signals from said paths.

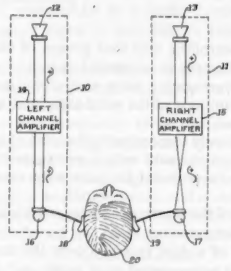


3,894,196

BINAURAL HEARING AID SYSTEM

Robert J. Briskey, Des Plaines, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed May 28, 1974, Ser. No. 473,970
Int. Cl. H04r *25/00*
U.S. Cl. 179—107 FD **6 Claims**



1. A system for binaurally enhancing auditory response in an individual having hearing impairments of comparable character in both ears, which system comprises:

a first electronic hearing aid having a predetermined frequency response characteristic and comprising a microphone, an amplifier, a reproducer, and means for coupling the output of said reproducer to the non-dominant ear of said individual;

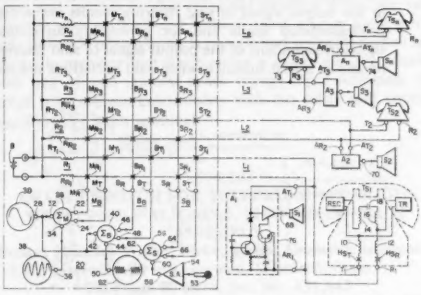
a second electronic hearing aid having a similar frequency response characteristic but with emphasized high-frequency response relative to that of said first hearing aid and comprising a microphone, an amplifier, a reproducer, and means for coupling said reproducer to the dominant ear of said individual;

and means for establishing a phase delay in the response of said second hearing aid relative to that of said first hearing aid.

3,894,197
AUDIO FREQUENCY SIGNALLING SYSTEMS FOR TELEPHONE SYSTEMS

Michael C. J. Cowpland, 11 Alderbrook Dr., Ottawa, Ontario, and Terrence H. Matthews, 99 Penfield Dr., Kanata, Ontario, both of Canada

Filed July 9, 1973, Ser. No. 377,831
Claims priority, application Canada, June 26, 1973, 174906
Int. Cl. H04m 1/60
U.S. Cl. 179—81 17 Claims



12. In a telephone system having a plurality of telephone lines, each telephone line originating at a central location and terminating at an associated telephone set at a remote location, each telephone line being connected to a direct current voltage supply at the central location and adapted for connection via hook switch contacts to the circuitry of the telephone set terminating said telephone line, a signalling system comprising;

a. a plurality of audio frequency amplifiers coupled to corresponding electro-acoustic transducers, each audio frequency amplifier having a pair of amplifier input terminals for receiving both audio frequency signal voltages and d.c. operating voltage, each audio frequency amplifier being associated with a particular telephone set and connected via corresponding amplifier input terminals across the telephone line of said particular telephone set, each audio frequency amplifier having a d.c. threshold voltage level and an a.c. threshold voltage level, the d.c. threshold voltage level being greater than the d.c. voltage across the telephone line at a telephone set when the hook switch contacts corresponding to said telephone set are closed;

b. means for generating a low frequency a.c. pilot signal;

c. means for adding voice frequency signals to said pilot signal to generate a combined audio frequency signal;

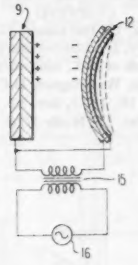
d. means for applying said combined audio frequency signal to a selected telephone line;

whereby when the hook switch contacts of a particular telephone set are open, resulting in the d.c. voltage level at the amplifier input terminals of the amplifier located at said particular telephone set exceeding the d.c. threshold of said amplifier, and when the combined signal appears at said amplifier input terminals to exceed the a.c. threshold voltage level of said amplifier and thereby enable said amplifier, said amplifier is energized by the d.c. voltage supply to amplify the voice frequency signal component of the combined signal appearing at said amplifier input terminals and produce a substantially corresponding audible voice frequency signal at the electro-acoustic transducer coupled to said amplifier.

3,894,198
ELECTROSTATIC-PIEZOELECTRIC TRANSDUCER

Haohiro Murayama; Takao Oikawa, and Kenichi Nakamura, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 6, 1972, Ser. No. 303,894
Claims priority, application Japan, Nov. 4, 1971, 46-87854
Int. Cl. H04r 17/00, 19/00
U.S. Cl. 179—110 A 4 Claims



1. An electrostatic type electroacoustic transducer comprising:

a. oscillator means fixed at two portions thereof and including a piezoelectric polymer sheet having stretching-type piezoelectric characteristics and electrodes on both surfaces of said polymer sheet;

b. at least one fixed electrode means facing said oscillator means and spaced therefrom; and

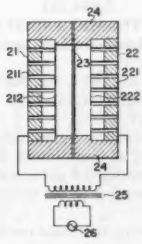
c. means for applying an alternating current electric input signal to both said oscillator and said electrode means, said oscillator means and said fixed electrode means being positioned such that, upon application of the input signal, the oscillating movement of said oscillator means is intensified by the combination of:

the bowing of said oscillator means between the two fixed portions thereof, said bowing being caused by the piezoelectric effect of the piezoelectric polymer sheet; and the attractive and repulsive forces between said oscillator means and said fixed electrode means.

3,894,199
ELECTRET ELECTROSTATIC ELECTROACOUSTIC TRANSDUCER

Masahiko Tamura; Kiyonori Iwama, both of Tokorozawa, and Mitsuo Asahina, Tokyo, all of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 18, 1970, Ser. No. 90,771
Claims priority, application Japan, Nov. 19, 1969, 44-92079
Int. Cl. H04r 19/00
U.S. Cl. 179—111 E 4 Claims



1. An electrostatic electroacoustic transducer comprising first and second electrets positioned to face each other; said

electrets having identical potentials on their facing surfaces, first and second back electrodes affixed to said first and second electrets, a vibrating film positioned between said electrets, said film being electroconductive on its surface, and a signal source wherein one terminal of said source is connected to said first back electrode and the other terminal is connected to said second back electrode.

3,894,200

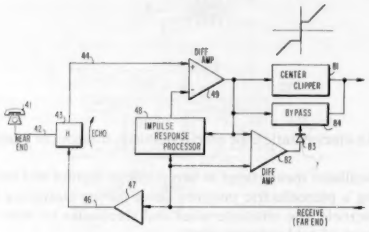
ADAPTIVE ECHO CANCELLER WITH DIGITAL CENTER CLIPPING

Samuel J. Campanella, Gaithersburg; G. Suyderhoud, Potomac; Michael Onufry, Jr., Gaithersburg, and Eric R. Kauffman, Walkersville, all of Md., assignors to Communications Satellite Corporation, Washington, D.C.

Filed Oct. 10, 1973, Ser. No. 405,209

Int. Cl. H04b *3/20*

U.S. Cl. 179—170.2 **4 Claims**



1. In an echo canceller of the type having an impulse response processing means including computation means for performing convolution of an input signal on a receive line and a replica signal of the impulse response of an echo path to generate an approximation of an echo signal for subtraction from a rear echo signal on a send line, means for subtracting said approximated echo signal generated by said computation means from said real echo signal to generate a residual echo signal; and an adaptive control loop responsive to the residual echo signal resulting from said subtraction and to stored samples of said input signal for incrementally varying said replica signal to reduce said residual echo signal, said processing means further including means to store a plurality of samples of said input signal and for replacing the oldest sample with each new sample, and means to store said incremented replica signal, the improvement comprising:

a. low level amplitude clipping means connected to said send line for passing all signals except those having amplitude levels in the range of said residual echo signal,

b. near-speech and double-talk detection means connected to said subtracting means and to said receive line and,

c. by-pass means actuated by said detection means to by-pass said clipping means.

3,894,201

SYSTEM FOR DYNAMIC AND STATIC MUTING

Gerald Dee Pyles, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed May 31, 1974, Ser. No. 475,139

Int. Cl. G11b *3/00*

U.S. Cl. 179—100.4 ST **13 Claims**

1. In a system for reproducing multichannel sound from a record medium having at least a main audio signal channel and a superaudible modulated subcarrier signal channel, a system for providing muting of the subcarrier signal channel comprising:

1. means for recovering from said medium said main audio frequency signal components and superaudible modulated subcarrier signal components;

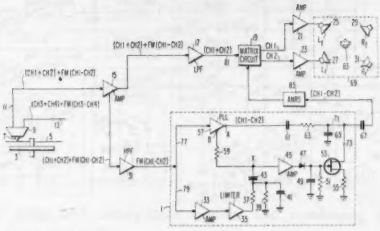
2. a sound reproducing system;

3. channel filtering means coupled to said recovering means for separating out said main audio frequency signal components from said superaudible modulated subcarrier signal components;

4. a signal processing channel coupled to said filtering means for demodulation of said separated subcarrier signal components and for coupling resultant demodulated subcarrier signal components to said sound reproducing system; and

5. means for muting said signal processing channel comprising:

a. a phase-locked loop circuit coupled to said filtering means for generating an output signal representative of the output signal of said filtering means when variations in the output signal of said filtering means are within predetermined limits and for generating an output signal independent of the output signal of said filtering means in a first instance when said variations are not



within said predetermined limits, and in a second instance when said output signal of said filtering means is substantially absent;

b. means coupled between said filtering means and said phase-locked loop circuit for comparing the output signals of said filtering means and phase-locked loop circuit and for generating an error signal when said output signals are different, and for providing a cancellation effect when said output signals are the same;

c. means responsive to said error signal for decoupling said signal processing channel from said sound reproducing system, thereby muting said demodulated subcarrier signal channel; and

6. signal combining means for coupling said main audio frequency signal components and the resultant demodulated subcarrier signal components of said signal processing channel to said sound reproducing system.

3,894,202

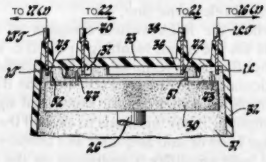
IGNITION DISTRIBUTOR FOR ROTARY INTERNAL COMBUSTION ENGINES

Robert E. Campbell, Anderson, and Richard D. Watson, Chesterfield, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 23, 1973, Ser. No. 418,675

Int. Cl. H01h *19/10*

U.S. Cl. 200—19 R **7 Claims**



1. An ignition distributor including a rotatable shaft for simultaneously directing ignition spark energy to the leading and trailing spark plugs for the same combustion chamber of an internal combustion rotary engine having a leading and a

trailing spark plug for each combustion chamber comprising: a leading spark plug output terminal for each leading spark plug; a trailing spark plug output terminal for each trailing spark plug; means for supporting said leading and trailing spark plug output terminals; a leading spark plug ignition spark energy input terminal supported in spaced relationship with each corresponding said leading spark plug output terminal; a trailing spark plug ignition spark energy input terminal supported in spaced relationship with each corresponding said trailing spark plug output terminal; a rotatable member of insulating material mounted upon and rotated by said rotatable shaft; and two electrically conductive members mounted upon and rotated by said rotatable member in arc-gap relationship with each of said ignition spark energy input terminals and each of said outut terminals and so located upon said rotatable member that while either is in arc-gap relationship with one of said ignition spark energy input terminals, the other is in arc-gap relationship with the other said ignition spark energy input terminal.

3,894,203
CRADLE SWITCH FOR TELEPHONE APPARATUS HAVING SELF-ALIGNING, PIVOTED CONTACT ASSEMBLY

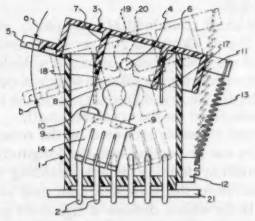
Helmut Heinrich Walter Diehr, Berlin, Germany, assignor to GTE International Incorporated, Stamford, Conn.

Filed Jan. 8, 1974, Ser. No. 431,643

Claims priority, application Germany, Jan. 18, 1973, 2302322

Int. Cl. H01h *21/26, 1/36;* **H04m** *1/00*

U.S. Cl. 200—6 R **6 Claims**



1. An improved cradle switch for a telephone, said switch comprising in combination a cup-shaped lower portion of insulating material including in the bottom thereof at least one row of contact pins which outside of said lower portion serve for connections and within said lower portion serve as contact elements, the side walls of said lower portion including bearing pins with a pair of slits in said side walls adjacent to said bearing pins, with one slit on each side of said bearing pins, and a hood tiltably supported on said bearing pins, said hood including at least one arm of insulating material with a comb-shaped spring contact member secured to the free end of said arm, said spring contacts being adapted to slidably engage said row of contact pins.

3,894,204
38KV LOW CURRENT FUSED SWITCH

William E. May, Feasterville, and Philip C. Netzel, Milmont Park, both of Pa., assignors to I-T-E Imperial Corporation, Spring House, Pa.

Filed Feb. 19, 1974, Ser. No. 443,461

Int. Cl. H01h *3/46, 9/20;* **H02b** *11/00*

U.S. Cl. 200—50 AA **9 Claims**

1. A low current switch comprising a movable bridging contact structure having an insulating transverse support and a pair of parallel contact probes extending therefrom;

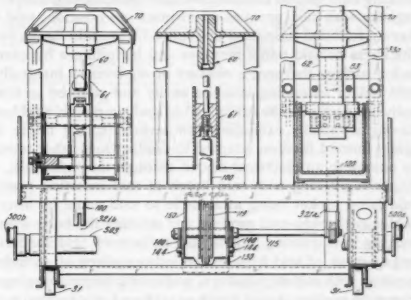
said support having a conductor electrically interconnecting said probes;

a stationary contact structure having an insulating support extending substantially normal to said contact probes;

a pair of stationary contacts carried by said stationary contact structure;

means for connecting each of said stationary contacts in circuit;

said movable bridging contact structure and its contact probes being movable in a direction longitudinally of said probes toward and away from said stationary contacts, each of said probes being engageable with one of said stationary contacts on such longitudinal movement toward said stationary contacts;



said insulating support for said stationary contacts having a pair of insulating bushings,

each bushing extending from a stationary contact toward said movable contact structure;

each of said bushings being aligned with one of said probes;

means for moving said bridging contact structure toward and away from said stationary contact structure,

said movable contact probes entering said bushings and engaging said stationary contacts, when the movable contact structure is moved toward said stationary contact structure,

said bushings acting as arc confining structures when said contacts are open.

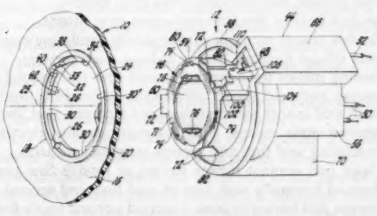
3,894,205
LAMP SOCKET AND PANEL ASSEMBLY WITH GROUNDING SWITCH

Joseph O. List, West Farmington, and Warren Pearce, Jr., Warren, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 21, 1974, Ser. No. 434,892

Int. Cl. H01r *19/50*

U.S. Cl. 200—51.07 **1 Claim**



1. A lamp socket and panel assembly comprising: a non-conductive panel, a central hub on said panel having an opening therein bounded by an outer peripheral surface defined by

alternating lands and grooves; axially projecting stop surfaces on said hub adjacent said grooves; a radial notch in said hub having a camming surface thereon; a lamp socket formed of a nonconductive elastomeric material, said socket having a body with front and rear portions; an annular flange on said body intermediate said front and rear portions; a center longitudinal cavity in said front portion of the body adapted to receive the base of a lamp bulb having lead wires connected to the filaments thereof, said intermediate flange adapted to engage the peripheral surface of said panel; first and second terminal members carried by said socket adapted to be connected in an electrical circuit, one of said terminals being disposed in said cavity and adapted to engage one lead of said lamp bulb; an annular conductive bulb holder carried on the front portion; said holder having a plurality of integral flexible locking ears spaced circumferentially therearound adapted to register with said grooves at an insertion position, said ears having rounded triangular tips spaced from said flange by the thickness of said panel member and including a hypotenuse index surface thereon; a contact prong formed integrally on said holder extending into the cavity and adapted to electrically connect with the other lead of said lamp bulb, said holder having a radially extending cantilevered spring finger integrally formed thereon adapted to contact said other terminal to complete an electrical circuit through the light bulb, said finger registering with said notch at said insertion position, said lamp socket being attachable to said panel by inserting said ears through said grooves and rotating the body with the locking ears passing across the surface of said lands until engagement of said hypotenuse index surface at an indexed position with said stop surface, said spring finger engaging said camming surface at said notch as said socket is rotated to said indexed position to bias said spring finger against said other terminal to complete the electrical circuit through said bulb only when said socket is in an indexed condition on said panel member.

3,894,206

PRESSURE RESPONSIVE SWITCH

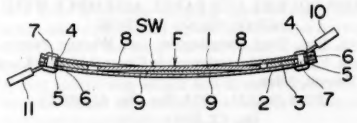
Masaru Suzuki, Chiryu, and Hatuyoshi Yoshida, Nagoya, both of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Japan

Filed Dec. 13, 1972, Ser. No. 314,528

Claims priority, application Japan, Dec. 18, 1971, 46-119892

Int. Cl. H01h *3/14*

U.S. Cl. 200—85 A **20 Claims**



1. A pressure responsive switch comprising

a first flexible electro-conductive strip means;

a second flexible electro-conductive strip means;

a flexible spacer member of electrically insulating material, said spacer member having at least one opening;

fastening means for connecting said first and second strip means and said spacer member together in a sandwich with said spacer member disposed between said first and second strip means, said fastening means electrically insulating said first and second strip means; and

at least one contact means having at least a first portion formed integrally with one of said first and second strip means and having at least a second portion freely formed from said one of said first and second strip means for electrically contacting the other of said first and second strip means, said at least one contact means being disposed in the plane of said one of said first and second strip means such that when said first and second strip means are concurrently flexed by a force, said second portion of said at least one contact means remains unflexed and is relatively displaced from a surface of said one of said first and second strip means being concurrently flexed, thereby contacting said other of said first and second strip means through said opening of said flexible spacer member.

3,894,207

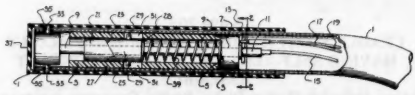
HAND GRIP TYPE VEHICLE DIRECTIONAL SIGNAL CONTROL SWITCH

James E. Jelley, Rt. 4, Box 1224, Gresham, Oreg. 97030

Filed July 5, 1973, Ser. No. 376,823

Int. Cl. H01h *21/24, 9/06*

U.S. Cl. 200—157 **8 Claims**



1. A vehicle directional control mounted within a steering handlebar carried upon a vehicle comprising:

an elongate hollow body;

means defining a longitudinal slot within the wall of the body;

an electrical contact on the body operatively connected to a signal light;

a rotatable shaft contained at least partly within the body and having an electrical contact pin thereon;

a source of electrical power upon the vehicle and having a terminal within the handlebar which is operatively connected to the electrical contact pin on the rotatable shaft;

a first cam fixed on the rotatable shaft;

a second cam slideably mounted on the rotatable shaft and having an ear projecting into the longitudinal slot in the body; position defining means including a spring interposed between the slideable cam and one end of the hollow body which defines a signal-off position of the control;

and a grip attached to the rotatable shaft for applying a torque to the shaft to rotate the shaft within the hollow body thereby coupling the electrical power source to the directional light on the body electrical contact via the shaft mounted contact pin, the positioning means being operable to automatically restore the control to the signal-off position when torque forces applied to the grip are released.

3,894,208

METHOD OF ABRASIVE MACHINING OF MATERIAL BY MEANS OF AN ENERGY BEAM

Wilfried Hellmuth Bergmann, Heimatring 44/II, 6000 Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 223,288, Feb. 3, 1972, abandoned. This application Sept. 27, 1973, Ser. No. 401,541

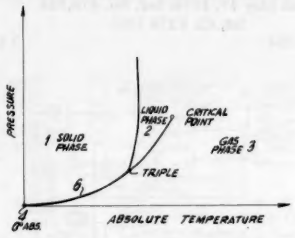
Claims priority, application Germany, Feb. 12, 1971, 2106823

Int. Cl. B23k *15/00*

U.S. Cl. 219—121 EM **7 Claims**

1. In the method of abrasive machining of a workpiece comprising solid material having a vapor pressure curve defining a phase boundary between the solid and gaseous state at a temperature and pressure below its Triple point, the improvement comprising cooling said solid material to a temperature and pressure below its Triple point; subjecting said solid

material to an energy beam to thereby transform a portion of said solid material immediately into the gaseous state without

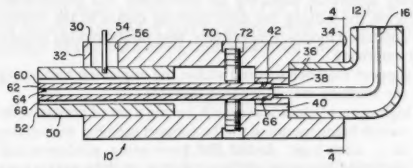


passing through a liquid state, and removing said portion of said solid material in the gaseous state.

3,894,209
NOZZLE FOR ENERGY BEAM SYSTEM

Thomas E. Fairbairn, Westland, Mich., assignor to Sirius Corporation, Toledo, Ohio

Filed Nov. 23, 1973, Ser. No. 418,721
Int. Cl. B73k *9/00*
U.S. Cl. 219—121 P **7 Claims**



1. In an apparatus for generating an energy beam, said apparatus including a sine wave generator having a tank coil formed of a first hollow electrically conductive tube and a second hollow electrically conductive tube positioned interiorly of said first hollow tube, and a system for supplying gas through each of said tubes, the improvement of a nozzle adapted to be attached at one end of said tubes comprising:

a first hollow cylindrical sleeve having first and second ends and an integral interior radial plate intermediate said first and second ends, said plate having at least two axial passages therethrough;

a second hollow cylindrical sleeve;

a hollow electrode;

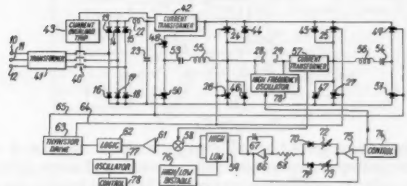
means for mounting said hollow electrode radially interiorly of said first sleeve and in communication with said first axial passage for defining a first continuous flow path through said nozzle from said second tube, through a first axial passage in said plate and through said electrode; and means for mounting said second sleeve radially intermediate said electrode and said first sleeve and in communication with said second axial passage for defining a second continuous flow path through said nozzle from said first tube, through said second axial passage in said plate, and through said second sleeve radially exteriorly of said electrode;

whereby, upon the application of gas through each of said tubes, a laminar gas flow is produced by said nozzle including an inner column of gas emanating from said hollow electrode and conducting said energy beam and an outer column of gas emanating between said electrode and said second sleeve and surrounding and sheathing said energy beam.

3,894,210
METHODS AND APPARATUS FOR ALTERNATING-CURRENT ARC WELDING

Gordon Arthur Smith, Oadby, and Robert George Stephens, Anstey, both of England, assignors to National Research Development Corporation, London, England

Filed Mar. 20, 1973, Ser. No. 342,981
Claims priority, application United Kingdom, Mar. 21, 1972, 1317272
Int. Cl. B23k *9/10*
U.S. Cl. 219—131 R **25 Claims**



1. A method of electric arc welding using a substantially non-consumable electrode, including applying a voltage between the electrode and a workpiece to strike an arc, the voltage periodically alternating in polarity, and varying the arc current to provide an arc current, the average magnitude of which, for intervals each equal to the period of the polarity alternations varies cyclically at a repetition frequency which has a longer period than the period of the polarity alternations.

3,894,211
METHOD OF SEALING THE END OF A FILLED WELDING ROD

Richard W. Young, Anaheim, and Sidney A. Siebert, Fullerton, both of Calif., assignors to Cabot Corporation, Kokomo, Ind.

Filed May 10, 1974, Ser. No. 468,806
Int. Cl. B23p *17/00*
U.S. Cl. 219—146 **8 Claims**

1. The method of closing filled tube rod ends comprising the steps of reducing the diameter of the ends and sealing with a solid organic film volatilizable at welding temperature to provide a contaminant free weldment.

3,894,212
ANALOG POWER COMPUTER

David R. Figueroa, Pembroke Pines, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed Mar. 11, 1974, Ser. No. 449,910
Int. Cl. G06g *7/20*
U.S. Cl. 235—193.5 **7 Claims**

1. Electronic apparatus for automatically producing a desired power value of a mathematic magnitude represented by a voltage input quantum, said apparatus comprising:

A. a plurality of integrators connected in series to one another,

B. first selector switch means for selecting a position related to the denominator of said power value,

C. second selector switch means for selecting a position related to the numerator of said power value,

D. first terminal means at the input side of the first of said plurality of integrators for receiving a reference voltage,

E. second terminal means coupled to the first selector switch means for receiving said input quantum,

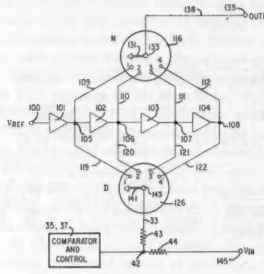
F. third terminal means coupled to the second selector switch means to enable obtaining said power value thereat,

G. the number of integrators equaling the higher of the components of the power value,

H. comparing means coupled to the first selector switch means for

a. comparing a voltage prevailing at the selected position of the first selector switch means with said input quantum, and

b. producing a characteristic output when said two compared voltages attain a predetermined relationship,



I. control circuit means coupled to said comparing means, said control circuit means constructed to receive said characteristic output and control the operations of the apparatus, including start and reset means,

wherein, upon the selector switch means being in the selected positions, the reference voltage and the input quantum being at said first and second terminal means, said desired power value is obtainable at said third terminal means.

3,894,213

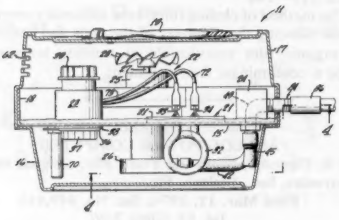
FLUID CIRCULATING HEATING PAD

Bhaskar Kumar Agarwala, West Los Angeles, Calif., assignor to Everest & Jennings, Inc., Los Angeles, Calif.

Filed Aug. 23, 1973, Ser. No. 390,753

Int. Cl.[2] F24H *1/20*

U.S. Cl. 219—297 **6 Claims**



1. In a controlled-temperature circulating fluid system:

a fluid reservoir having inlet and outlet ports;

fluid heating means connected to said inlet and outlet ports, said fluid heating means comprising a fluid heater with a heating element in said reservoir;

inlet and outlet channels each connected to one of said ports, each of said channels having a passageway into the reservoir;

a temperature control device responsive to temperatures in both of said channels for energizing or deenergizing said heating means as the temperature affecting said temperature control device falls below or rises above predetermined temperature levels; and

fluid circulating means interposed into one of said passageways having an output port connected to the channel connected to the reservoir outlet port.

3,894,214

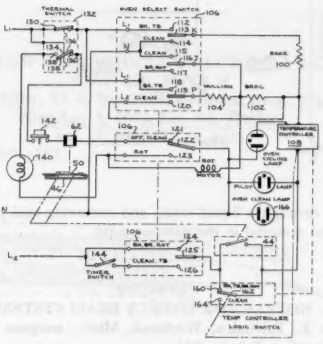
DOOR-LOCKING APPARATUS FOR A COOKING OVEN

Paul R. Staples, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed May 17, 1974, Ser. No. 470,724

Int. Cl. F27d *1/02*

U.S. Cl. 219—394 **7 Claims**



1. A cooking appliance comprising an oven cooking cavity formed by a box-like oven liner and an access door, heating means for supplying heat energy into the oven cooking cavity, means for latching the door in the closed position, safety locking apparatus requiring an intentional and independent operation for locking the door latching means in the latched and unlatched modes, respectively, said safety locking apparatus comprising

a support member secured within the appliance and having the latching means secured thereto;

a high-current electrical switch having a set of contacts, the switch being mounted on the support member and serving as a latch-logic device for preventing predetermined phases of operation of the appliance until the access door is in the latched and locked-closed position;

switch-actuating means associated with the support member and movable in response to operation of the door latching means for actuating the switch;

said switch-actuating means including at least one cam-ramp surface for mechanically engaging the switch to effect operation thereof and for providing mechanical advantage to break possibly welded contacts in the switch; and

a locking member associated with the support member for preventing operation of the switch-actuating means until intentionally and independently operated both when the door is latched and when unlatched and for preventing predetermined phases of operation of the appliance until the locking member is in the locked position.

3,894,215

TIME CLOCK SYSTEM

Richard Lotter, Ridgewood, and Bernard Roger Fernau, Malverne, both of N.Y., assignors to Decicom Systems, Inc., Brooklyn, N.Y.

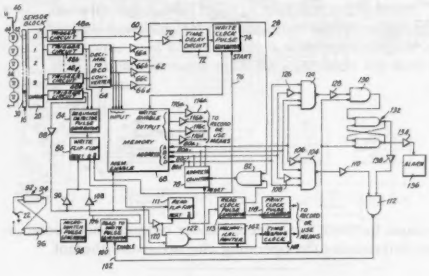
Filed Oct. 17, 1973, Ser. No. 407,334

Int. Cl. G06k *7/10*

U.S. Cl. 235—61.6 R **13 Claims**

1. A time clock system for use with a time card having identifying indicia on a portion thereof arranged in a plurality of digits spaced in one direction along said card, comprising time card guide means defining a path for the displacement of said time card in a direction substantially parallel to said one direction along said card; sensing means in the path of displacement of sid time card for reading of identifying indicia when the indicia-bearing portion of one of said time cards is

passed thereby; memory means coupled to said sensing means for temporarily storing data representative of the read indicia; means for detecting the passage of said card along a prescribed path in said guide means past said sensor means, said detecting means including means for counting the number of



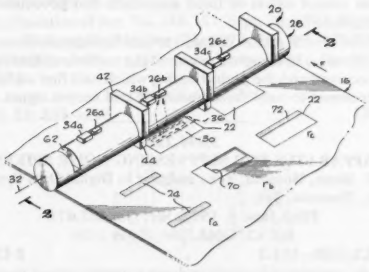
digits read by said counting means, and card position sensing means for detecting the passage of the card past the sensor means to the end of said prescribed path; and means for enabling the transmitting from said memory means of the temporarily stored data representative of the read indicia in response to an output of said detector means representative of the combined occurrence of the counting of a predetermined number of digits and the actuation of said card position sensing means at the end of said prescribed path, and therefor the passage of said card along said prescribed path.

3,894,216

ILLUMINATION AND SENSOR ARRANGEMENT FOR CARD READER

David M. Bottles, Long Beach, Calif., assignor to Compucorp, Los Angeles, Calif.

Filed July 27, 1973, Ser. No. 383,383
Int. Cl. G06k 7/10; G08c 9/06
U.S. Cl. 235—61.11 E **8 Claims**



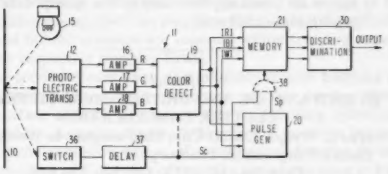
4. A card reader for reading marks or other encoding on a card that moves along a predetermined card path, comprising:
a light sensor spaced from said card path;
a light source spaced from said card path; and
light control means including a lens positioned so it lies between the card path and both the sensor and light source, said lens concentrating light from the source onto a predetermined card path location and focusing light from within said location onto said light sensor.

3,894,217

DEVICE FOR DISCRIMINATING COLOR CODED ARTICLES

Rinzou Ebukuro, and Tomoyuki Isono, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Dec. 27, 1973, Ser. No. 428,973
Int. Cl. G06k 7/10; G08c 9/06
U.S. Cl. 235—61.11 E **5 Claims**



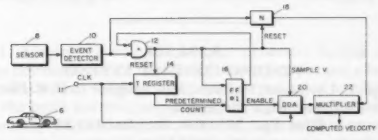
1. A device for discriminating articles having predetermined color codes from other articles, said codes comprising areas, each colored in one of a predetermined number of colors, with the colored areas arranged in predetermined orders, said device including color sensitive means responsive to rays incident thereon from the colored areas of each article having one of said codes for producing a train of color signals representative of the respective colors of the areas of said one code, wherein the improvement comprises:
a pulse generator responsive to each of said color signals for producing a pulse,
an encoder responsive to each of said color signals for producing a coded signal representative of the color represented by said each color signal,
shift register means responsive to said coded signal and to the pulse produced in response to the color signal responsive to which said coded signal is produced, for producing a set of parallel coded signals,
a plurality of decoders responsive to said parallel coded signals for producing said parallel signals, and
discrimination means responsive to said parallel signals for producing a signal representative of said each article.

3,894,218

VARIABLE INVERSE PERIOD TIMER

Harold E. Weissler, Newport News, Va., assignor to The Bendix Corporation, Southfield, Mich.

Filed Mar. 14, 1974, Ser. No. 451,260
Int. Cl.² G06F 15/20
U.S. Cl. 235—150.3 **13 Claims**



1. Means for computing the reciprocal of the period between recurring events comprising:
means for counting the occurrence of each event;
a digital differential analyzer including at least a first register responsive to clock pulses applied thereto for accumulating said clock pulses and including means for generating the locus of a point which is instantaneously proportional to the reciprocal of said period when enabled;
a source of said clock pulses;
latching gates means responsive to the occurrence of an event when said gate is unlatched for resetting to predetermined states said first register and said means for

counting; for sampling said means for generating; and, for latching said gate means, said gate means being non-responsive to the occurrence of events while latched, said gate means including means for unlatching in response to said first register attaining a predetermined first state and additionally including means for enabling said digital differential analyzer in response to said first register attaining said predetermined first state; and,

means for multiplying the sample obtained from said digital differential analyzer by the number contained in said means for counting, the result of the multiplication comprising said reciprocal.

3,894,219

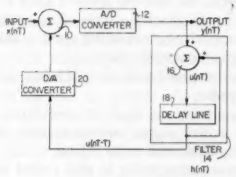
HYBRID ANALOG AND DIGITAL COMB FILTER FOR CLUTTER CANCELLATION

Wayne L. Weigel, Ellicott City, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 16, 1974, Ser. No. 433,958

Int. Cl. G06j *1/00*

U.S. Cl. 235—150.5 **10 Claims**



1. A system for cancelling clutter from an analog input signal and producing a digital output signal, comprising:

a first summer receiving the analog input signal and producing an output,

an analog to digital converter receiving the output of said first summer and producing a corresponding digital output comprising the digital output signal of the system,

a filter receiving the digital output of said analog to digital converter and producing as an output a filtered signal having a predetermined mathematical relationship to the output signal of the analog to digital converter,

a digital to analog converter receiving the output of said filter and producing as an output an equivalent analog signal wherein,

said first summer receives and sums said filtered signal in subtractive relationship with the analog input signal.

3,894,220

VENDING CONTROL SYSTEM

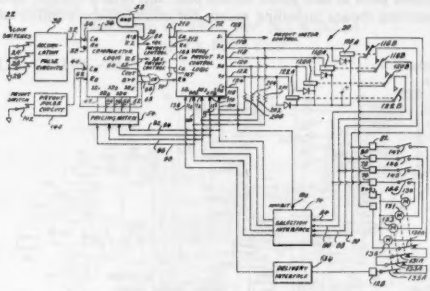
Joseph L. Levasseur, St. Louis, Mo., assignor to H. R. Electronics Company, High Ridge, Mo.

Filed Apr. 25, 1974, Ser. No. 463,887

Int. Cl. G06f *7/50, 15/46*

U.S. Cl. 235—151 **26 Claims**

1. A control circuit comprising an adder network formed by a plurality of bistable adder stages each including first and second inputs and an output, a first source of signals connected to the first adder network inputs, a plurality of second input signal sources and means for individually applying signals from selected ones of said plurality of second signal sources to selected inputs of the second adder network inputs, said adder network including means to combine inputs from the first and second sources to produce outputs at the respective adder outputs, and means for connecting selected outputs of the adder network to selected ones of the second adder inputs whereby output signals appearing on said selected adder circuit outputs produce changes in the adder which further effect the adder outputs, the arrangement of the connections between the selected adder outputs and second inputs determining the operating characteristics thereof.



3,894,221

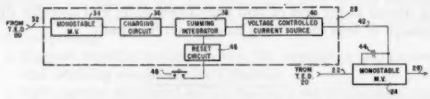
SPEED UP CIRCUIT IN AN APPARATUS FOR MEASURING A DIVIDING PARTICLE SIZE OF A PARTICULATE SYSTEM

David R. Figueroa, Pembroke Pines; Edward Neal Doty, Pompano Beach, and Anthony Marino, Plantation, all of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Mar. 1, 1974, Ser. No. 447,264

Int. Cl. G06g *7/12*; **G01n** *27/00*

U.S. Cl. 235—151.3 **26 Claims**



7. In an apparatus for ascertaining that particle size, within a particulate system, above and below which size predetermined fractions of the total mass of the system are respectively included, said particle size being the dividing size between fractions, and which includes a threshold circuit operative to develop a first signal in response to passage through said apparatus of each individual particle in excess of a particular size, a speed-up circuit including in combination,

first circuit means coupled to said threshold circuit means and operative in response to each first signal to develop an output signal of fixed amplitude and predetermined duration, and

second circuit means coupled to said first circuit means and operative in response to one of the number of first signals received and the period during which said first signals are received to vary the duration of said output signal.

3,894,222

APPARATUS FOR SUPPRESSING NOISE SPIKES

Lee E. Siems, Houston, Tex., assignor to Digital Data Systems, Inc., Houston, Tex.

Filed June 3, 1974, Ser. No. 475,471

Int. Cl. G06f *7/00*; **G01v** *1/36*

U.S. Cl. 235—151.3 **5 Claims**

1. An apparatus for scaling down extreme-valued members of a discrete time series consisting of a set of floating-point numbers, each number including a sign, a true exponent $Ex_{(f)}$, and a mantissa, said apparatus including:

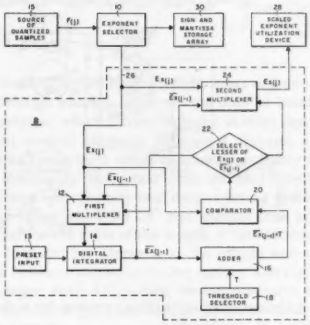
an exponent selector having an input adapted to sequentially receive said numbers and to provide to its output only the true exponents $Ex_{(f)}$ of said numbers;

first and second multiplexers, each multiplexer having a first input, a second input and an output, the first inputs of said multiplexers being connected to the output of said exponent selector;

a digital integrator having an input connected to the output of said first multiplexer and having an output connected to the second input of said second multiplexer, said integrator being adapted to integrate exponents with respect to time and to provide at its output a present value $Ex_{(j-1)}$ of the integrated exponents;

a feedback loop interconnecting the output of said integrator with the second input of said first multiplexer;

an adder having an input connected to the output of said integrator, said adder adding a constant threshold quantity T to said present value $Ex_{(j-1)}$ to form the sum $(Ex_{(j-1)} + T)$; and



a comparator interconnected between the output of said exponent selector and the output of said adder, for determining the lesser of the quantities $Ex_{(j)}$ and $(Ex_{(j-1)} + T)$, said comparator including control logic for activating the first inputs of said first and second multiplexers thereby to receive the true exponents $Ex_{(j)}$ when $Ex_{(j)}$ is the lesser quantity, and for activating the second inputs of said first and second multiplexers thereby to receive $Ex_{(j-1)}$ when $(Ex_{(j-1)} + T)$ is the lesser quantity, whereby the output of said second multiplexer provides a desired scaled exponent $Es_{(j)}$.

3,894,223
MAGNETIC BUBBLE DOMAIN LOGICAL AND ARITHMETIC DEVICES

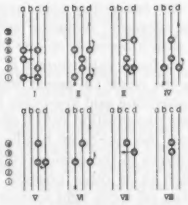
Hideyasu Majima, Higashiyamato; Itsuo Mikami, Kodaira, and Yuzo Kita, Kokbunji, all of Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 181,757, Sept. 20, 1971, abandoned. This application Dec. 26, 1973, Ser. No. 428,036

Claims priority, application Japan, Sept. 21, 1970, 45-81972

Int. Cl. G06f 7/50

U.S. Cl. 235—175 **13 Claims**



1. A magnetic bubble domain logical and arithmetic device comprising:

a sheet of a magnetic material, wherein cylindrical bubble domains are maintained at a predetermined size, when bias magnetic field of a predetermined strength is applied normal to the planar surface;

first means for uniformly applying bias magnetic field of the predetermined strength normal to the entire planar surface of said sheet;

second means for applying locally to respective regions of said sheet a reverse bias magnetic field of a predetermined strength in the reverse direction with respect to the direction of said uniformly applied bias magnetic field thereby establishing in said respective regions a trapping field having a magnetic strength lower than that of the uniformly applied bias magnetic field, so that the cylindrical bubble domains are retained within trapping regions by respective trapping fields,

said second means forming a plurality of said trapping regions arranged adjacent to one another on the planar surface at such a distance that neighboring cylindrical bubble domains, disposed therein, are unstable because of the repulsion forces of neighboring domains to one another, said plurality of trapping regions forming at least one array of trapping regions;

third means for injecting cylindrical bubble domains, representative of information to be processed by logical operations, into said array of trapping regions;

fourth means shifting the cylindrical bubble domains in the array of trapping regions at a predetermined timing, said fourth means being connected to said array; and

fifth means for deriving output binary coded information represented by the presence or absence of cylindrical bubble domains at predetermined positions in the array of trapping regions, whereby various kinds of logical operations are carried out.

3,894,224
CURRENT-DRIVEN FUNCTION GENERATOR

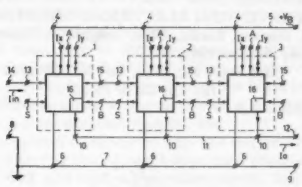
Aart Gerrit Korteling, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 11, 1974, Ser. No. 449,849

Claims priority, application Netherlands, Mar. 30, 1973, 7304430

Int. Cl. G06g 7/26

U.S. Cl. 235—197 **5 Claims**



1. A current-controlled function generator having a function current input for the variable input current and a function current output for the output current produced as a function of the input current, consisting of n sections, which are substantially identical and are cascaded, each section comprising a section current output which is connected to the function current output, only one section supplying current to the function current output as a function of the input current I_{in}, with a first input for a current of the value I_{in}, with a first output which supplies a current of the value I_{in}, with a second input for a current I_x, which when $I_{in} - I_x$ is greater than zero switches on the section, with a third input for a current I_y, which determines the initial value of the output current, with a switching output which supplies a switching signal when the section is switched on, with a inhibiting input, which switches off the section upon receipt of a switching signal, and with a current converter with a control input, by means of which the gradient A between the input current and the output current can be adjusted, and that each section is connected with its'

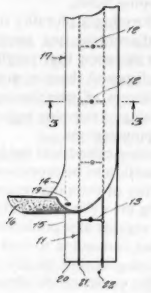
first input to the first output and with its switching output to the inhibiting input of the preceding section, the first input of the first section being connected to the function current input.

3,894,225

TAPE-LAMPS

Albert L. Chao, 144-24 37th Ave., Apt. LA, Flushing, N.Y. 11354

Filed July 11, 1974, Ser. No. 487,789
Int. Cl.[2] F21S *1/14;* **F21V** *21/08*
U.S. Cl. 240—1 R **2 Claims**



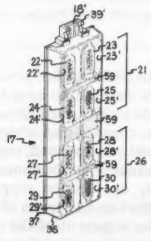
1. In a tape-lamp assembly, the combination of a length of tape, and a row of mini-lamps along said tape, said mini-lamps being in a parallel electrical circuit, said tape comprises a pair of adjacent tape members between which said circuit is contained, said tape members being secured together by suitable adhesive therebetween, said tape members are each made of flexible transparent plastic and at least one said tape members has a row of openings therethrough and in each of which one of said mini-lamps is located.

3,894,226

PHOTOFLASH LAMP ARRAY HAVING MEANS FOR PREVENTING ELECTRICAL SHORTING

James M. Hanson, Euclid, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Sept. 26, 1974, Ser. No. 509,411
Int. Cl. G03b *15/02*
U.S. Cl. 240—1.3 **4 Claims**



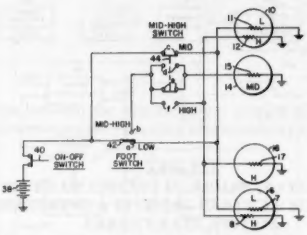
1. A photoflash lamp array comprising a circuit board having lamp-firing circuitry on a surface thereof, a plurality of flash lamps positioned over said surface and having lead-in wires connected to said circuitry, and an electrically conductive reflector unit positioned between said lamps and said circuit board, wherein the improvement comprises a sheet of electrically insulating material interposed between said reflector unit and said circuit board.

3,894,227

TRI-BEAM ROADWAY-LIGHTING SYSTEM FOR MOTOR VEHICLES

Elam Pitkjaan, Cedar Grove, and Leland W. LeSeur, Cedar Knolls, both of N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 445,751, Feb. 25, 1974, abandoned. This application Oct. 10, 1974, Ser. No. 513,917
Int. Cl. B60g *1/00, 3/00*
U.S. Cl. 240—7.1 A **16 Claims**



1. A tri-beam roadway-lighting system for a motor vehicle comprising, in combination;

four headlamps mounted on the front of the motor vehicle with a pair of headlamps disposed on each side of the centerline thereof,

one headlamp in each of said pairs of headlamps comprising a dual-function headlamp having a lens, a reflector with a focal point, and a pair of light sources one of which is disposed in on-focus relationship and the other of which is disposed on off-focus relationship with said reflector, said on-focus light sources when energized producing low-beam illumination and a low-beam lighting mode,

another headlamp in either one of said pairs of headlamps comprising a mid-beam headlamp having a lens, a reflector with a focal point, a single compact light source which is positioned adjacent said focal point, and a shield that is disposed in front of and in masking relationship with said compact light source, said mid-beam headlamp when energized producing a beam of light which supplements the low-beam illumination produced by said on-focus light sources and thereby provides a mid-beam lighting mode,

the remaining headlamp in said pairs of headlamps comprising a high-beam headlamp that has a lens, a reflector with a focal point, and a single on-focus light source which, when energized in conjunction with said mid--beam headlamp and the off-focus light sources in said dual-function headlamps, produces a high-beam mode of illumination, and

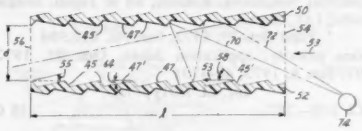
circuit means for energizing said headlamps and light sources in the aforesaid sequence including (a) a main two-position switch operable in one position to connect only the two on-focus light sources in said dual-function headlamps to the electrical power supply of the vehicle and thereby providing said low-beam lighting mode, and (b) an auxiliary two-position switch operable in one position to connect the mid-beam headlamp to the two on-focus light sources in the dual-function headlamps, said auxiliary switch in its other position being operable to connect the two off-focus light sources in said dual-function headlamps to the light sources in said mid-beam and high-beam headlamps,

said main switch in its other position being operable to connect said auxiliary switch to the electrical power supply of the vehicle.

3,894,228
LIGHT CONTROL DEVICE

Sanford Cobb, Jr., St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sept. 24, 1973, Ser. No. 400,253
Int. Cl. F21v *11/02*
U.S. Cl. 240—46.31 **14 Claims**

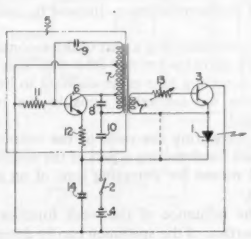


1. A light control device having a light input end and a light output end through which a beam of light may be transmitted in a given direction, which device includes at least one pair of opposing light control elements defining a channel, each of which elements comprise a series of broad specularly reflecting surfaces alternately facing said input and said output ends, the angle formed between any said output facing surface and said direction being less than 20° and greater than an angle whose cotangent is the ratio of the length of said channel over the distance between the elements at the output end and the angle formed between any input facing surface and said direction being greater than 45°, which device obstructs light of said beam which diverges from said given direction by more than a desired angle.

3,894,229
SIGNAL GENERATOR

Hiroshi Mouri, Kyoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed July 23, 1973, Ser. No. 381,483
Claims priority, application Japan, July 28, 1972, 47-76166; July 28, 1972, 47-76167; July 28, 1972, 47-76168; July 28, 1972, 47-89455
Int. Cl. H04b *9/00*
U.S. Cl. 250—199 **5 Claims**

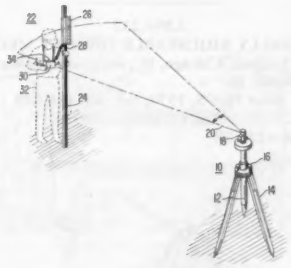


1. A signal generator comprising
a. an oscillating circuit for producing a sinusoidal output voltage signal;
b. a transistor having an emitter, a base and a collector;
c. a load element connected in series with the emitter-collector circuit of said transistor;
d. a dry element battery connected to said oscillating circuit and across said series-connected load element and transistor, the voltage of said battery characteristically becoming lower with the passage of time; and
e. means for coupling the output of said oscillating circuit between the base and emitter of said transistor, said coupling means including a resistor connected in series with the base of said transistor and the output of said oscillating circuit, the resistance of said resistor being selected to prevent reduction in the current through said load element despite a reduction in the voltage of said battery or in the output voltage signal of said oscillating circuit, the impedance between the base and emitter of said transistor not increasing and the voltage supplied between the base and emitter of said transistor not being reduced even when the output of said generating circuit is reduced and the base current of said transistor is reduced.

3,894,230
APPARATUS FOR DETECTING THE POSITION OF A MOVING OR MODULATED LIGHT BEAM

Robert J. Rorden, Santa Clara, and Gerald Hunter Williams, Sunnyvale, both of Calif., assignors to Coherent Radiation, Palo Alto, Calif.

Filed Oct. 25, 1973, Ser. No. 409,565
Int. Cl. G01j *1/20*
U.S. Cl. 250—203 R **10 Claims**



1. Apparatus for detecting the position of a moving or modulated light beam relative to a reference plane comprising:
a. a linearly aligned array of photo-detecting devices oriented perpendicularly to said reference plane, where said photo-detecting devices are positioned with respect to each other in increments corresponding to the units of position to be measured;
b. a numerical read-out display;
c. means responsive to the temporary energization of a photo-detecting device for providing a numerical read-out on said display of the position of the beam relative to said reference plane whenever one of said photo-detecting devices is energized thereby; and
d. a latching device associated with and responsive to each photo-detecting device which links each photo-detecting device with said read-out providing means, said latching device maintaining a read-out on said display for a sufficiently long period of time for human observation.

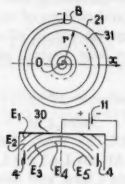
3,894,231
IMAGE CONVERTER OR INTENSIFIER DEVICE

Maurice Verat; Lucien Guyot, and Bertrand Driard, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 21, 1973, Ser. No. 417,921
Claims priority, application France, Nov. 28, 1972, 42260
Int. Cl. H01j *31/50, 39/12, 39/00*
U.S. Cl. 250—213 VT **4 Claims**

1. An image converter or image intensifier device comprising, within an evacuated envelope:
a photocathode comprising an electrically conductive layer and a photoemissive layer, these layers being applied on one another, said photoemissive layer emitting, when operating, photoelectrons under the impact of an incident photon stream, said conductive layer being plane shaped and made of a filiform conductor in the form of a spiral, one of whose ends being located near the center of said

photocathode and the other end at the periphery thereof;
a luminescent screen on which said photoelectrons impact;



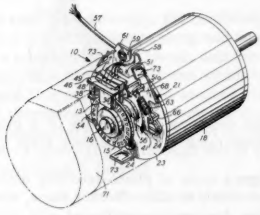
first means for accelerating said photoelectrons towards said screen;
second means for providing potential differences between different points of said spiral.

3,894,232

ROTATIONALLY ADJUSTABLE SUPPORT MECHANISM

Richard E. Laspesa, Chicago, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed May 8, 1974, Ser. No. 468,049
Int. Cl. G01p *3/36*
U.S. Cl. 250—231 SE **10 Claims**



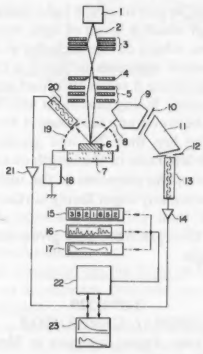
9. In a shaft position sensing assembly wherein an adjustable sensor is positioned adjacent a motor shaft-mounted and driven encoder, the combination further comprising:
a rotationally adjustable support mechanism, said mechanism including:
a base plate securable to a shaft end of the housing of the motor, and having a centrally located semi-circular opening which surmounts two shoulders formed therein, and further having a tab formed therein, said tab being spaced to one side of said opening and extending outwardly from one side surface of said base plate;
an angularly adjustable member having a sensor supporting ledge formed as an integral part thereof, and having a major planar region with a semi-circular opening formed in a central area thereof, the openings in said adjustable member and base plate being dimensioned such that the arcuate edges thereof when aligned and juxtaposed, are substantially coextensive between the shoulders of said base plate, said adjustable member further having a tab formed therein, said tab being spaced to one side of the opening therein and extending outwardly from one side surface thereof so as to be in overlying and spaced relationship with respect to said tab of said base plate; and
means for adjusting the spacing between said tabs, to thereby control the angular displacement of said adjustable member, together with said sensor supported thereon, relative to both said base plate and adjacent shaft driven encoder, said adjusting means including a threaded member extending through a tapped hole formed in one of said tabs, and further including a biasing spring connected between said base plate and adjustable member so as to continuously maintain the inner free end of said threaded member biased against the other of said tabs.

3,894,233

ION MICROPROBE ANALYZER

Hifumi Tamura, Hachioji; Toshio Kondo, Sagamihara, and Kazumitsu Nakamura, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 29, 1973, Ser. No. 410,504
Claims priority, application Japan, Oct. 27, 1972, 47-107191; Jan. 8, 1973, 48-4701
Int. Cl. H01j *37/26*
U.S. Cl. 250—307 **18 Claims**



1. An ion microprobe analyzer comprising:
means for generating a primary ion beam;
means for bombarding a specimen with said primary ion beam;
means for detecting a part of the secondary particles emitted from all elements contained in the specimen as a result of the bombardment thereof by said primary ion beam;
means for mass-analyzing a part of the secondary ions in the secondary particles emitted from said specimen;
means for detecting ions of an element to be analyzed derived from the secondary ions in the mass-analyzing means; and
means for measuring the ratio of the output signals from said means for detecting a part of the secondary particles and said means for detecting ions of an element to be analyzed;
whereby the influence of the work function of the bombarded surface of the specimen can be determined so that a measurement of the concentration distribution of an element of the specimen in the direction of the depth of the specimen can be measured precisely.

3,894,234

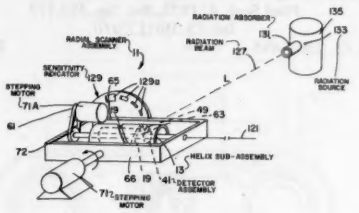
RADIAL SCANNER

John W. Mauch, Danville, and Emil M. Bergh, Walnut Creek, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 28, 1974, Ser. No. 437,441
Int. Cl. G01t *1/16*
U.S. Cl. 250—358 **5 Claims**

1. A radial scanning device for sampling the interface area integrity of a member and including a radiation source and comprising:
a. a means for scanning said member;
b. said scanning means comprises a detector;

c. said radiation source emitting radiation for passing through said member;
d. said means positioned for scanning radiation passing through said member;
e. said detector of said scanning means comprises a cylinder having a helical slit formed therein;



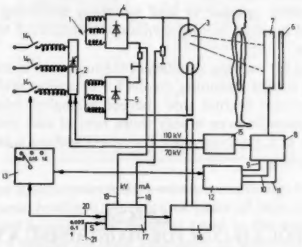
f. said radiation detector positioned within said cylinder;
g. first means for rotating said cylinder about its longitudinal axis; and
h. second means for rotating said detector and said cylinder about an axis perpendicular to said longitudinal axis.

3,894,235

X-RAY DIAGNOSTIC APPARATUS FOR THE PREPARATION OF X-RAY EXPOSURES INCLUDING A TIMER SWITCH FOR DETERMINING THE EXPOSURE TIME

Kurt Franke, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 26, 1974, Ser. No. 464,655
Claims priority, application Germany, June 8, 1973, 2329414
Int. Cl. G03b 41/16
U.S. Cl. 250—402 **3 Claims**



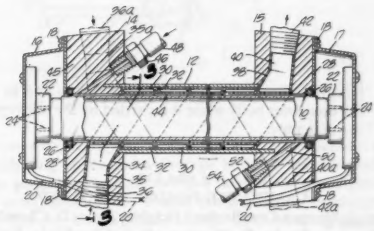
1. In an X-ray diagnostic apparatus for the preparation of X-ray exposures, including timing switch means for determining the exposure time; and a control circuit for providing a predetermined X-ray dosage to a patient, said control circuit having a dosage output measuring arrangement, comparator means connected to said measuring arrangement for comparing the actual value of the dosage output with a reference value so as to effect an optimum X-ray image darkening within the respective exposure time, and setting means for at least one of the operating parameters of an X-ray tube in said apparatus, said setting means being controlled by an output signal from said comparator means for correlating said actual value with said reference value, the improvement comprising; selector switch means for programming an X-ray tube voltage and automatically set exposure time periods suitable for a plurality of varied patient constitutions, said selector switch means selecting a first exposure time for initiating an exposure and transmitting a reference value-forming signal to said comparator means representative of the required dosage output for said exposure time, said selector switch means and setting means for the X-ray tube voltage adapted to be controlled by said comparator means upon initiation of an exposure so as to correlate the actual value of the dosage output with a reference value, so as to effect a reduction in the X-ray tube voltage upon said actual value being higher than the reference value, and to effect a switching-over sequence to a successively longer exposure time and conveyance of a new reference value to said comparator means in conformance with said last-mentioned exposure time upon said actual value being lower than the reference value.

3,894,236

DEVICE FOR IRRADIATING FLUIDS

Wayne K. Hazelrigg, 3624 S. Carolina St., San Pedro, Calif. 90731

Filed Dec. 10, 1973, Ser. No. 423,136
Int. Cl. H01j 37/00
U.S. Cl. 250—435 **22 Claims**



1. In a device for radiant treatment of flowing fluid, the combination of:
an elongated lamp providing a source of radiant energy and having an envelope wall; and
passage means for flow therethrough of fluids to be treated by the radiant energy;
said passage means comprising a plurality of tubes of flexible non-metallic material having a unitary wall structure transparent to said radiant energy in side-by-side relationship each being of substantially smaller cross sectional area than the radiant source;
said tubes being positioned to jointly provide an overall configuration of an annulus surrounding and substantially completely encasing the envelope wall of said radiant source.

3,894,237

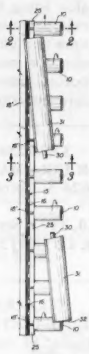
METHOD AND APPARATUS FOR CURING INKS ON METAL CONTAINERS BY ULTRA VIOLET LIGHT

Gary E. Choate, Golden, and Larry Mason Dugan, Boulder, both of Colo., assignors to Coors Container Company, Golden, Colo.

Filed Feb. 19, 1974, Ser. No. 443,367
Int. Cl.² H01J 37/00
U.S. Cl. 250—453 **7 Claims**

1. Apparatus for curing inks and decorative coatings on containers comprising
a. a conveyor having container rotating means on which decorated containers are mounted for rotation while being carried by the conveyor,
b. means for rotating said container rotating means, and
c. an ultra violet light assembly including a longitudinally extending lamp tube and reflector, said assembly extending at an oblique angle to the path of travel of the conveyor for beaming a band of concentrated ultra violet light on the rotated containers while the containers move past the light assembly, the angle at which the assembly

extends relatively to the path of travel of the conveyor being determined by the axial length of the containers such that each container receives bands of ultra violet



light in helical pattern progressively from end to end of the container body while it is carried by the conveyor past the assembly.

3,894,238

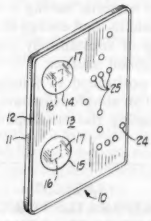
LAMINATED DOSIMETRIC CARD

Francis Morgan Cox, Bedford Heights; James D. Chamberlain, Aurora; Erwin F. Shrader, East Cleveland; Bruce M. Shoffner, Shaker Heights, and Andras Szalanczy, Oakwood Village, all of Ohio, assignors to Kewanee Oil Company, Bryn Mawr, Pa.

Continuation-in-part of Ser. No. 203,281, Nov. 30, 1971. This application Dec. 5, 1973, Ser. No. 422,014

Int. Cl. G01t *1/11*

U.S. Cl. 250—484 **8 Claims**



1. A laminated card adapted to be worn by a person susceptible to potentially injurious radiation, comprising a foraminous, code-adaptable rigid substrate of essentially non-luminescent material on which is adhered a non-luminescent sheet of film material light-permeably coded in light-transmitting registry with particular holes of said substrate to enable said card to be uniquely identified in accordance with a preselected code, said substrate having vertical edges confining said film material, and, a depressed portion, said depressed portion providing a rectangular trough or recess along the opposite side of said substrate, said substrate and said non-luminescent sheet having one or more apertures from about 0.2 cm. to about 2 cm. in diameter, each said aperture adapted to have commonly disposed therebetween in said trough or recess a dosimeter encapsulated in an envelope of a heat-sealable essentially non-luminescent synthetic polymeric resin, said envelope being secured between said substrate and said film material, whereby a dosimeter may be heated at a pre-determined location in an automatic evaluation instrument.

3,894,239

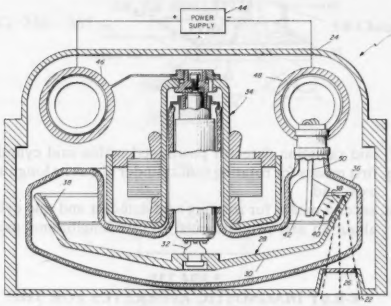
MONOCHROMATIC X-RAY GENERATOR

Martin Braun, Stamford, Conn., assignor to Raytheon Company, Lexington, Mass.

Filed Sept. 4, 1973, Ser. No. 393,773

Int. Cl. H01j *35/10*

U.S. Cl. 250—493 **8 Claims**



1. An x-ray generator comprising:

means for generating a beam of electrons having a predetermined energy;

a target comprising a material which emits fluorescent x-radiation when illuminated on a first side thereof with electrons of said predetermined energy, the width of said target being many times greater than its depth, at least a portion of said radiation being emitted from a second side of said target opposite said first side;

a housing opaque to said radiation enclosing said target, said housing having a window transparent to said radiation;

means for moving said target through said beam, said moving means including means for orienting said target such that said second side thereof is angled relative to said window to permit only those rays of said radiation emitted at a glancing angle from said second side to exit said housing.

3,894,240

CONTROL CIRCUIT FOR MAINTAINING A MOVABLE MEDIUM BETWEEN LIMITS

Ronald N. Rose, Lake Worth, Palm Beach, Fla., assignor to Simer Pump Company, Minneapolis, Minn.

Filed Mar. 22, 1974, Ser. No. 454,020

Int. Cl. H01j *39/12*

U.S. Cl. 250—577 **5 Claims**

1. A control circuit for maintaining a movable medium between predetermined limits comprising:

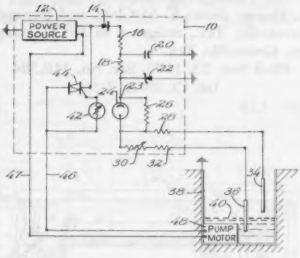
upper and lower limit probes operable to detect the presence of said medium at the upper and lower limits respectively;

a power source;

a light source means requiring a higher ignition current than sustaining current connected to said power source and to said upper and lower limit probes;

voltage means controlled by the current flowing to said probes, said light source means requiring current flow through both probes to ignite but through only one probe to remain on;

means for detecting if the light source means is burning; and medium control means connected to said detecting means so as to vary said medium responsive to the state of said light source means.



3,894,241

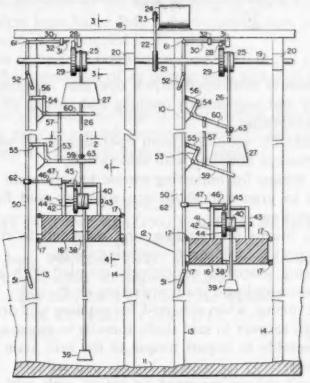
WAVE ACTION POWER SOURCE

Saul Kaplan, 405 Highland Ave., Merion, Pa. 19066

Filed Mar. 8, 1974, Ser. No. 449,248

Int. Cl. F03b *13/12*

U.S. Cl. 290—42 **5 Claims**



1. A power source powered by waves comprising, in combination, a frame having a plurality of pairs of legs extending into water and having a top member fixed to the upper ends of said legs, a horizontal shaft journalled in said frame above the water, a first pulley rotatably mounted on said shaft between each pair of said legs, a first releasable rachet mechanism preventing rotation of each of said first pulleys in a first direction, a non-releasable rachet in each of said first pulleys driving said shaft when each of said first pulleys is rotated in the other direction, a chain hanging over and engaging each of said first pulleys and having first and second ends, a first heavy weight fixed to the first end of each of said chains urging rotation of said first pulleys in the first direction, a float constrained to rise and fall on waves between each pair of legs, a second pulley rotatably mounted on each of said floats, said second pulleys each engaging the second end of one of said chains, a second releasable rachet mechanism on each of said second pulleys allowing rotation of said second pulleys when said floats on which said second pulleys are mounted rise on waves, a second lighter weight at the second end of each of said chains below said floats so that rising and falling of said floats raises said first weights, and means sumultaneously releasing both of said releasable rachet mechanisms associated with each of said first weights when said first weights are raised to a given height to drop said first weights and rotate said shaft by means of said non-releasable rachets, said means releasing said releasable rachet mechanisms allowing said releasable rachet mechanisms to engage when said first weights fall a given distance.

3,894,242

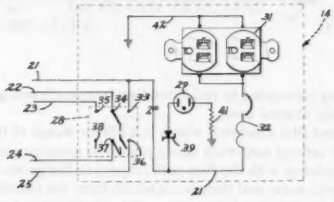
ELECTRICAL POWER CONVERTING APPARATUS

Oscar D. Helling, Mankato, Minn., assignor to GTO Enterprises, Inc., St. Peter, Minn.

Continuation of Ser. No. 366,327, June 4, 1973, which is a continuation of Ser. No. 232,126, March 6, 1972. This application Jan. 10, 1974, Ser. No. 432,220

Int. Cl.² H02J *3/12, 4/00*

U.S. Cl. 307—10 R **17 Claims**



1. Power converting apparatus for use in an electrical system including an electrical storage battery, variable output voltage generating means having a field winding energizable by an external source to enable the generation of electrical energy thereby, and regulator means for controlling the voltage level applied to the battery from the voltage generating means and for switchably connecting the battery to said winding for energization thereof, the power converting apparatus comprising:

a. power outlet means;

b. first connector means for connecting the power outlet means to the output of the voltage generating means so that the power outlet means is in continuous electrical communication with the voltage generating means to receive its full range of voltage potential;

c. switch means having a common pole and first and second poles selectively connectable with the common pole;

d. the first pole being connected to the first connector means;

e. second connector means for connecting the common pole with the battery and the regulator means;

f. and third connector means for connecting the second pole and the field winding of the voltage generating means;

g. whereby selective connection of the common and first poles of the switch means maintains the battery at a regulated potential and applies said regulated potential to the power outlet means;

h. and selective connection of the common and second poles of the switch means connects the battery directly with said field winding and maintains the power outlet means at the unregulated output potential of the voltage generating means.

3,894,243

POLYMERIC TRANSDUCER ARRAY

Seymour Edelman, Silver Spring, Md.; Steven C. Roth, Fairfax, Va., and Carol F. Vezzetti, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 6, 1974, Ser. No. 477,142

Int. Cl.² H04R *19/00*

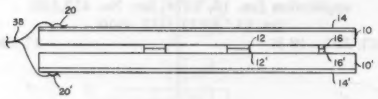
U.S. Cl. 307—88 ET **10 Claims**

1. An array of polymeric film transducers for sensing dynamic pressure and vibrations comprising:

a first film sandwich comprising a sheet of permanently polarizable polymeric film coated with a plurality of geometrically shaped areas of electrically conductive material on one surface, said areas being laid down in a desired array configuration, said polymeric film being coated on the other surface with a conductive material which covers at least the same area covered on the first side by the geometrically shaped areas,

the area of polymeric film under each geometrically shaped area being permanently poled,

said first surface of said polymeric film further having leads of conductive material laid down thereon, a different lead



being connected to and extending from each said geometrically shaped area;

a second film sandwich which is a mirror image of the first, said second sandwich being placed in geometrical correspondence with the first with respect to the geometrically shaped areas and their leads which form the interface, the two sandwiches being adhered to each other to form a composite sandwich;

electrical connection means making electrical contact with the leads in the interface area; and

electrical connection means making electrical contact with both of said outer conductive coatings.

3,894,244

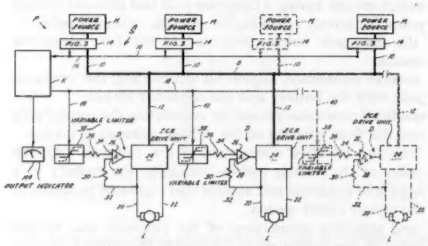
POWER LIMIT AND CONTROL SYSTEM

Ross K. Hill, 7752 Hammerly, Houston, Tex. 77055

Filed Oct. 3, 1973, Ser. No. 403,323

Int. Cl. H02j *3/00*

U.S. Cl. 307—16 **14 Claims**



13. A method of monitoring the power capability of a group of power sources having drive control circuits and limiting the power drawn from such sources to a magnitude within the capabilities of such sources, comprising the steps of:

a. sensing the most heavily loaded of the power sources, said step of sensing comprising the steps of:

1. sensing the current output from the sources;

2. sensing the kilowatt output from the sources;

b. comparing the power output of the most heavily loaded of the power sources with a reference power level; and

c. energizing the drive control circuits of the loads to limit the power drawn from the group of power sources to a magnitude within the output capabilities of the power sources when the reference power level is reached.

3,894,245

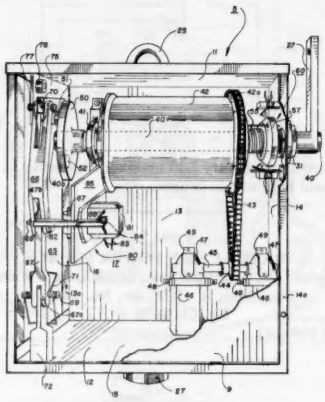
AUTOMATICALLY RESPONSIVE STORED ENERGY MECHANISM FOR OPENING AND CLOSING AN ELECTRICAL SWITCH

Maurice A. Hogue; James E. McClain, and Howard L. Scott, all of Greenville, Tex., assignors to ESCO Manufacturing Company, Greenville, Tex.

Filed Nov. 23, 1973, Ser. No. 418,384

Int. Cl. H01h *3/16*

U.S. Cl. 307—124 **12 Claims**



1. A remote controlled switch operator apparatus for responsively and sequentially opening and closing an electrical switch, comprising:

a. a rotatably mounted main operating shaft adapted for mechanical coupling with said switch;

b. first means for imparting torque to said main operating shaft to urge said shaft into rotation; said first means comprising:

drum means surrounding, and mounted to rotate with respect to, said main operating shaft,

a spring assembly operatively coupled with said drum means and said main operating shaft, and

drive means, when actuated, for rotating said drum means with respect to said shaft, thereby to cause said spring assembly to impart torque to the said main operating shaft;

c. second means mounted to rotate with said operating shaft, said second means including a pair of stops circumferentially disposed around said shaft;

d. latch means releasably and separately engaging each of said stops;

e. trip release means operatively coupled to said latch means for releasing said latch means from engagement with one of said stops in response to a first electrical signal, and returning said latch means to releasable engagement with the other of said stops; and thereafter releasing said latch means from engagement with the other stop in response to a second electrical signal and returning said latch means to releasable engagement with the one stop, thereby to limit the unrestrained rotation of said shaft to first and second discrete angular positions, the degree of rotation of said shaft between said first and second angular positions being less than a full revolution; and

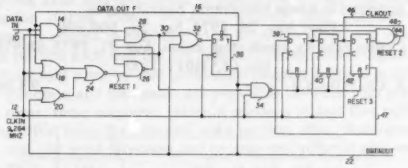
f. control means responsive to the extent of torque on said operating shaft for deactuating said drive means when said torque is at a first predetermined amount and for preventing the release of said latch means when said torque is at a second predetermined amount less than said first predetermined amount.

3,894,246

CLOCK RECOVERING APPARATUS AND METHOD

Willard J. Torgrim, Springville, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed June 24, 1974, Ser. No. 482,395
Int. Cl.[2] H03K *19/08, 1/17;* H04K *7/00*
U.S. Cl. 307—208 4 Claims



4. Apparatus for producing a clock signal having the proper phase relationship with respect to a received data signal comprising, in combination:

means for generating a high frequency clock signal;

means for counting the high frequency clock signal whereby it is divided to a lower frequency clock signal;

means for generating a logic 1 first signal upon the simultaneous occurrence of a high frequency clock signal of a given first logic value and of an incoming data signal occurring after a minimum period of time of not receiving a data signal value of the second logic value;

means for generating a logic 1 output data signal upon the next occurrence of the high frequency clock having the given first logic value only if the incoming data signal has remained at the second logic value;

means for setting the counting means to an initial condition after the generation of an output data signal of the logic 1 value; and

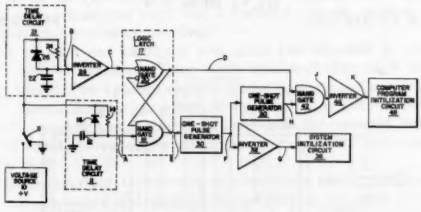
means for returning the logic 1 value output data signal to a logic zero at a predetermined count of the means for counting the high frequency clock signal.

3,894,247

CIRCUIT FOR INITALIZING LOGIC FOLLOWING POWER TURN ON

Robert De Jong, Placentia, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 26, 1973, Ser. No. 428,481
Int. Cl.[2] H03K *19/08, 5/13, 1/12*
U.S. Cl. 307—208 6 Claims



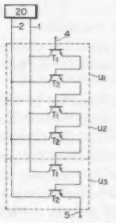
1. A power initialization circuit comprising in combination: first and second charging circuit means each having an input terminal and an output terminal, said first and second charging circuit means producing first and second time delays, respectively, following the application of a predetermined voltage to the input terminals of said charging circuit means; first inverter means having an input terminal and an output terminal, said input terminal of said inverter means connected to said output terminal of said second charging circuit means for inverting the logical value of the signal produced by said second charging circuit means; latch means having first and second input terminals and at least a first output terminal, said first input terminal connected to the output terminal of said first charging circuit means and the second input terminal of said latch means connected to said output terminal of said first inverter means for providing an output signal at the end of the longer of the first and second time delay periods.

3,894,248

DYNAMIC SHIFT REGISTER UTILIZING MINORITY CARRIER STORAGE EFFECT OF SEMICONDUCTOR DEVICE

Takashi Asaoka, Tokyo, Japan, assignor to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Continuation of Ser. No. 198,286, Nov. 12, 1971, abandoned.
This application Sept. 17, 1973, Ser. No. 397,839
Claims priority, application Japan, Aug. 11, 1971, 46-60261
Int. Cl. G11c *11/36, 11/40*
U.S. Cl. 307—211 R 11 Claims

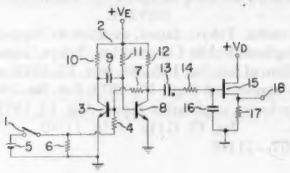


1. A dynamic shift register comprising first and second feeder lines, a source of voltage connected to apply alternating voltages having first and second levels in a complementary manner, to said first and second feeder lines and a plurality of unitcircuits each comprising first and second transistors for storage of minority carriers, the collectors of said first and second transistors being connected to said first and second feeder lines respectively, means connecting the emitter of said first transistor to the base of said second transistor, said connecting means consisting of a direct current path free of direct current connections to said first feeder line external of said source and free of interconnection other than to said transistors with direct current voltage levels that affect the shift of minority carriers from said first to said second transistors, the base of said first transistor being used as an information input terminal and the emitter of said second transistor being used as an output terminal, whereby when said first voltage level is applied to said first feeder line while said second voltage level is applied to said second feeder line, the current flows across the collector junction of said first transistor in response to the signal applied to said input terminal, thereby storing the minority carriers in said collector junction region, when said second voltage level is applied to said first feeder line while said first voltage level is applied to said second feeder line, the current which is controlled depending upon whether the minority carriers are stored in said first transistor or not flows across the collector junction of said second transistor, thereby shifting the storage of minority carriers into the collector junction region of said second transistor, and when said first voltage level is applied to said first feeder line while said second voltage level is applied to said second feeder line, said minority carrier stored in said second transistor is shifted through said output terminal to the next unit circuit thus shifting the information represented by the storage of minority carriers from one unit circuit to the next unit circuit.

3,894,249
DEVICE FOR GENERATING VARIABLE OUTPUT VOLTAGE

Shunji Minami; Shunzo Oka, and Takehide Takemura, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Dec. 14, 1973, Ser. No. 424,647
Claims priority, application Japan, Dec. 20, 1972, 47-128492; Dec. 20, 1972, 47-147212; Dec. 20, 1972, 47-147213
Int. Cl. H03k 4/02
U.S. Cl. 307—227 **4 Claims**

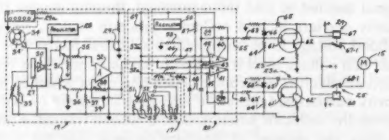


1. A device for generating variable output voltage comprising
   a. a MOS field-effect transistor,
   b. a non-polarized capacitor connecting the gate of said MOS field-effect transistor to ground,
   c. a neon bulb,
   d. an input resistor connected in series with the neon bulb,
   e. a monostable multivibrator means connected to the gate of said MOS field-effect transistor through said input resistor and said neon bulb for providing a single square wave output pulse in response to an input signal, said square wave output pulse having a predetermined electrical potential and a duration sufficient only to charge said non-polarized capacitor through said input resistor and said neon bulb to a potential that is less than one-half the predetermined electrical potential.
   f. a switch connected to said monostable multivibrator means for providing said input signal, and
   g. an output resistor connecting the source of said MOS field-effect transistor to ground, whereby when said switch is repeatedly closed, the output voltage derived from the source of said MOS field-effect transistor increases stepwise.

3,894,250
HALL CELL POSITION SENSOR FOR OUTBOARD DRIVE APPARATUS

James R. Hager, Fond du Lac, and Hugh E. Riordan, West Bend, both of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Division of Ser. No. 329,726, Feb. 5, 1973, Pat. No. 3,834,345. This application Mar. 21, 1974, Ser. No. 453,349
Int. Cl. H01r 5/00; B63b 41/00; B60q 1/26
U.S. Cl. 307—309 **6 Claims**

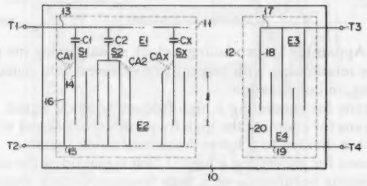


1. A Hall cell sensor for producing a sine wave signal proportional to tilt positioning of a pivotally mounted outboard drive unit, comprising Hall cell having a tubular housing having attachment means for supporting the housing in fixed relation with respect to the outboard drive unit, an annular magnetic means adjacent to said Hall cell and having attachment means for securing the magnetic means to the outboard drive unit coaxially with the axis of rotation of the drive unit, said magnetic means being diametrically magnetized to produce an operative flux field varying as a sine wave with angular orientation.

3,894,251
ELASTIC SURFACE WAVE TRANSDUCER

Kimio Shibayama, and Hiroaki Sato, both of Sendai, Japan, assignors to Kimio Shibayama, Sendai, Japan

Filed Aug. 26, 1974, Ser. No. 500,696
Claims priority, application Japan, Aug. 31, 1973, 48-97887
Int. Cl.[2] H01V 7/00
U.S. Cl. 310—9.8 **9 Claims**

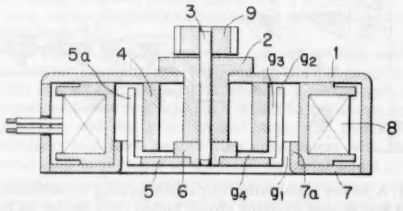


1. An electric surface wave interdigital transducer comprising first and second electrodes disposed on a piezoelectric substrate and each having a common electrode connected to an external terminal and a plurality of electrode fingers connected to said common electrode, the overlap lengths of the interdigital electrode fingers of said first and second electrodes being uniform throughout the transducer, characterized in that the electrode fingers of said first electrode are divided into a plurality of sections each including at least one electrode finger; and that capacitors are connected between the finger or fingers of the respective sections and said common electrode.

3,894,252
ELECTRIC MOTOR WITH MEANS FOR MAGNETICALLY PREVENTING AXIAL VIBRATION

Haruo Miwa, Mino-kamo; Yasushi Hasegawa, Nagoya; Toyoshi Mori, and Yoshitaka Iwase, Nagoya, all of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Japan

Filed Dec. 26, 1973, Ser. No. 427,506
Claims priority, application Japan, Dec. 26, 1972, 47-1009
Int. Cl. H02k 5/24
U.S. Cl. 310—51 **19 Claims**



1. In an electric motor including a permanent magnet stator magnetized radially to provide north and south poles alternating at equal angular spacing, a rotary shaft disposed coaxially with said permanent magnet stator, a rotor fixed to said rotary shaft and having a circular body portion lying in a radial plane through said shaft and pole teeth of soft teeth of soft magnetic material extending from the periphery of said body portion along the magnetized face of said permanent magnet stator

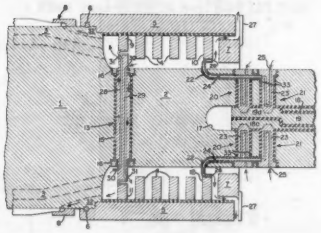
keeping a gap therebetween, the number of said poles of the permanent magnet stator being an even multiple of the number of said pole teeth, an annular exciting coil concentric with said permanent magnet stator and said rotor and spaced from said rotor, and a casing including a yoke which forms a magnetic circuit interlinking said annular exciting coil with said pole teeth; the improvement comprising means relatively axially locating said rotor with respect to said permanent magnet stator and yoke for continuously applying a non-zero total net axial magnetic force to said rotor in only one axial direction during motor rotation, wherein said permanent magnet is spaced in said one axial direction from said rotor body portion such that the net direction of any axial magnetic force on said rotor by said permanent magnet stator is in said one direction and flux paths are providing between said yoke and rotor, rotor magnetic material portions at said flux paths being offset from the opposed yoke portion other than opposite said one axial direction and to urge said rotor in said one direction.

3,894,253

VERY HIGH CURRENT FIELD WINDING FOR DYNAMOELECTRIC MACHINE ROTOR

David M. Willyoung, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 25, 1973, Ser. No. 409,651
Int. Cl.[2] H02K *1/32*
U.S. Cl. 310—61 **6 Claims**



1. A field winding for a two pole dynamoelectric machine rotor of the type having a body portion formed with axially extending insulated slots and a reduced spindle portion at either end thereof comprising:

a. at least one electrical conductor bar disposed in each axially extending rotor body insulated slot; each slot defined by a pair of radially extending arms and each arm terminating in an enlarged retaining lip portion; each electrical conductor extending radially outward from within its respective slot approximately to the rotor surface;

b. an inner coil terminating conductor for each rotor pole;

c. an outer coil terminating conductor for each rotor pole; said inner and outer coil terminating conductors electrically connected to said rotor body conductor bars;

d. a pole to pole connector electrically connecting said inner coil terminating conductors;

e. a plurality of terminal studs connected to a negative and positive source of excitation current; and,

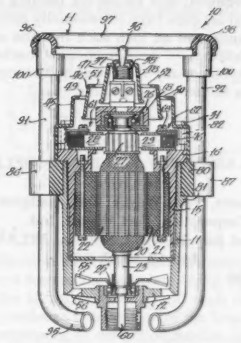
f. a plurality of electrical leads connecting the terminal studs to outer coil terminations, said terminal studs and said electrical leads each are arranged with communicating internal cooling passages and having a coolant inlet on each terminal stud disposed closer to the rotor spindle than a coolant outlet from said lead.

3,894,254

ELECTRIC MOTOR POWER UNIT

Grover P. Holther, Jr., Mt. Prospect, Ill., assignor to Racine Federated, Inc., Racine, Wis.

Filed Mar. 4, 1974, Ser. No. 447,504
Int. Cl. H02k *7/00*
U.S. Cl. 310—66 **10 Claims**



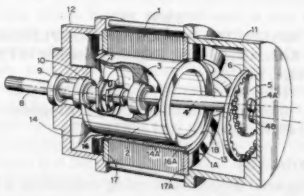
1. An electric motor power unit for driving a concrete vibrator comprising, a casing housing the motor, a handle support of resilient material encircling and secured to said casing and having pats thereof at a distance from the casing, a handle of a quadrilateral shape at a distance from the casing and having a plurality of sides defining four corners therebetween which corners are in alignment with the parts of the handle support, each of said handle sides being of a length to permit engagement thereof by the hand of an operator, a plurality of elongate frame members fitted into said parts and the handle at said corners to define a protective enclosure for the unit and with said handle support provide a mounting for said handle.

3,894,255

SYNCHRONOUS MACHINE FOR STEPPING MOTOR AND OTHER APPLICATIONS AND METHOD OF OPERATING SAME

George C. Newton, Jr., Concord Rd., Lincoln, Mass. 01773

Filed Jan. 11, 1973, Ser. No. 322,638
Int. Cl. H02k *7/10*
U.S. Cl. 310—80 **29 Claims**



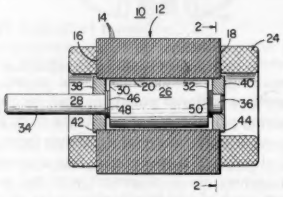
1. A synchronous stepping motor machine, having, in combination, housing means; stator means provided with a plurality of poles, fixed in said housing means; armature means separated by air gaps from said poles; electrical means, comprising windings connected with current sources, for sequentially magnetizing said stator poles, thereby producing magnetic flux in the air gaps associated with the magnetized poles; suspension means for maintaining said armature means properly oriented with respect to said stator means and for suspending said armature means for oscillatory movement thereof in directions to substantially vary the thickness of said air gaps; an output member; bearings supporting said output

member for movement with respect to said housing means; means for mechanically amplifying the oscillatory movements of said armature means; conversion means interconnecting said amplifying means, housing means and output member for converting the amplified oscillatory movement of the armature means into movement of said output member that is unidirectional for at least more than one half cycle of armature means movement; and means for limiting the thickness variations of said air gaps from substantially zero to the order of a few thousandths of an inch such that the said magnetic flux, under conditions of near maximum machine performance, changes substantially less than the corresponding fractional change in the air gap thickness.

3,894,256
BEARING ASSEMBLY FOR DYNAMOELECTRIC MACHINE

Mitchell D. Sholtz, Fort Wayne, Ind., assignor to Bowmar Instrument Corporation, Fort Wayne, Ind.

Filed July 26, 1973, Ser. No. 382,838
Int. Cl. H02k *5/00*
U.S. Cl. 310—90 **6 Claims**



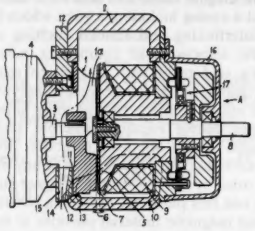
1. In a dynamoelectric machine having a stator core member formed of magnetic material and having opposite end faces with a bore extending axially therebetween, said stator core member having radially inwardly extending teeth defining winding slots therebetween extending radially outwardly from said bore and axially between said end faces, said teeth having inner ends defining said bore a rotor member in said bore, said rotor member being mounted on a shaft and having opposite ends, and bearing means on said shaft respectively adjacent said opposite ends of said rotor member for rotatably supporting the same, the improvement wherein said bearing means are non-magnetic and are respectively mounted in said bore engaging said inner ends of said teeth.

3,894,257
MAGNETIC INDUCTION COUPLINGS

Jonathan Reed, Cambridge, England, assignor to Pye Limited, Cambridge, England

Filed Mar. 14, 1974, Ser. No. 451,149
Claims priority, application United Kingdom, Mar. 23, 1973, 14149/73; Dec. 10, 1973, 57195/73
Int. Cl. H02k *49/04*
U.S. Cl. 310—105 **7 Claims**

1. A magnetic induction coupling comprising a first rotatable part of ferromagnetic material carrying a plurality of axially extending pole pieces, a second rotatable part comprising a disc of non-ferromagnetic material disposed opposite and axially spaced from said pole pieces, a stator of magnetic material having a portion disposd on the opposite side of said disc from said pole pieces and including or connected to a region extending around the opposite side of said first rotatable part to said disc to define an airgap extending axially between said region and said first rotatable part, means associated with said stator for producing a magnetic field which passes through said disc and said pole pieces and through said axial airgap and wherein the proportions of the face area and length of said axial airgap and of the further axial airgap containing said disc are such that any axial pull due to magnetism between the first rotatable part and said stator portion is

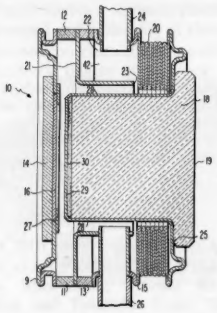


balanced by axial pull due to magnetism between said first rotatable part and said region.

3,894,258
PROXIMITY IMAGE TUBE WITH BELLOWS FOCUSSING STRUCTURE

Gilbert Nason Butterwick, Leola, Pa., assignor to RCA Corporation, New York, N.Y.

Filed June 13, 1973, Ser. No. 369,581
Int. Cl. H01j *39/18, 11/01, 39/02*
U.S. Cl. 313—102 **6 Claims**



1. A proximity focussed image tube comprising:
a. a vacuum containing body including:
   1. a transparent heat conducting input window sealed to one end of said body;
   2. an output screen sealed to another opposed end of said body;
   3. a vacuum containing envelope including at least one tubular portion sealed between the opposed ends of said body which include said input window and output screen; said envelope being sealed to said input window and output screen by flanged portion which extend from opposed ends of said envelope and enclosing therewith an evacuated interior which extends between said opposed ends of said body;
b. a semiconductor photocathode mounted within said evacuated interior; said photocathode having a surface in contact with said input window;
c. a phosphor coating within the evacuated interior of said envelope on a surface of said output screen;
d. a bellows system including an expandable vacuum containing bellows having opposed ends which are sealed to portions of said envelope between said photocathode and said output screen whereby said surface of said output screen having said phosphor coating may be moved from a fixed proximity focussed position adjacent said photocathode to a position further removed from said photo-

cathode by expansion of said bellows system, the expansion of said bellows system providing thermal and stress isolation of said output screen from said photocathode;

e. a chamber forming baffle system within the evacuated interior of said envelope whereby said photocathode may be uniformly exposed to vapors introduced into said system, said system including:

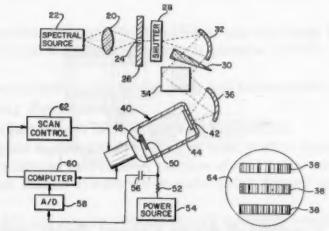
1. a baffle member extending into the evacuated interior of said envelope from a portion of the envelope; said baffle member forming a baffle chamber within the evacuated interior of said envelope substantially enclosed by surface portions of: said envelope, said output screen, and said baffle member;
2. an input tube extending from an outer portion of said envelope, and including a vapor passage communicating with and opening into said baffle chamber for introducing vapors into said system;
3. an exhaust tube extending from an outer wall portion of said envelope and including a vapor passage communicating with and opening into a portion of the evacuated interior, other than said baffle chamber, in which a surface of said photocathode is exposed; and
4. a vapor passage between said baffle chamber and said portion of said evacuated interior other than said baffle chamber, whereby vapor communication through and between said input and exhaust tubes may be accomplished.

3,894,259

MOSAIC PHOTOELECTRIC TARGET

Robert H. Webb, Lexington, Mass., assignor to Block Engineering, Inc., Cambridge, Mass.

Filed Jan. 8, 1973, Ser. No. 321,748
Int. Cl. H01j *31/26*
U.S. Cl. 313—368 **9 Claims**



1. In an electro-optical image device having a target with an image-receiving surface, and an optical system for imaging onto said surface an image which has a substantially time invariant outline and is substantially spatially fixed with respect to said surface so that said outline will cover only a portion of said surface, the improvement characterized in that substantially only the portion of said surface which receives said image is provided with image-translating material.

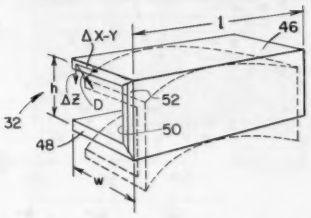
3,894,260

COLOR SELECTION ELECTRODE SUSPENSION SYSTEM WITH BIMETAL STRUCTURES HAVING ORTHOGONAL DEFLECTION COMPONENTS

Stanley J. Sedivy, Chicago Ridge, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Dec. 12, 1973, Ser. No. 424,018
Int. Cl. H01j *29/02, 29/08*
U.S. Cl. 313—405 **19 Claims**

1. A suspension system for supporting a color selection electrode adjacent the faceplate portion of a color cathode ray tube envelope, comprising a plurality of suspension devices disposed at spaced points around the periphery of the electrode for supporting the electrode adjacent to said faceplate portion, each device comprising mask-mounted means affixed to said electrode which retentively engages envelopemounted means affixed to said faceplate portion, said mask-mounted means including bimetal means comprising effective first and second orthogonally acting bimetal pairs, said bimetal means reacting, when heated, such that said first bimetal pair produces a deflection of the bimetal means with a primary component of deflection motion to cause the suspended electrode to be displaced toward the faceplate along the central Z axis of the tube for Q compensation, and such that said second bimetal pair produces a deflection of the bimetal means with a primary component of deflection motion in an X-Y plane orthogonal to the Z axis to at least partially compensate for thermal expansion of said X-Y plane and thereby reduce the build-up of expansion-induced stresses in the suspension system and in the electrode.

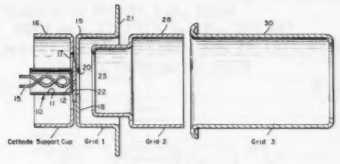


3,894,261

NO-CROSSOVER ELECTRON GUN

Rayard R. Corson, Carlsbad, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed July 9, 1973, Ser. No. 377,366
Int. Cl.² H01J *29/48, 29/62*
U.S. Cl. 313—449 **1 Claim**



1. An electron gun consisting of a cathode assembly including a metallic sleeve having a closed end at one extremity thereof thereby to provide a planar surface, and electron emissive material on said planar surface, and a heating element within said sleeve for heating said electron emissive surface; a cup-shaped electrode disposed concentrically about and substantially coextensive with said sleeve with a centrally disposed aperture surrounding said planar surface means for providing a control electrode having an aperture therein disposed adjacent and parallel to said planar surface for producing an electron beam; and means for providing a plurality of cylindrical accelerating elements about the path of said electron beam.

3,894,262

FLICKER ELIMINATION CIRCUIT

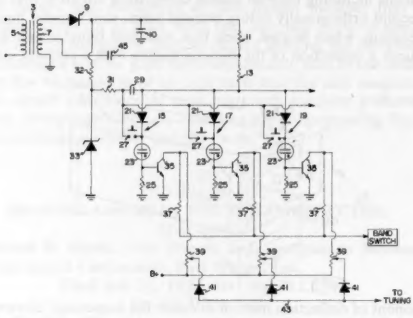
David Lee Funston, and Joseph Edward Thomas, both of Batavia, N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 31, 1974, Ser. No. 474,870
Int. Cl.² H05B *37/00*
U.S. Cl. 315—161 **3 Claims**

1. In an electronic channel address system for a signal receiver having a plurality of parallel-coupled signal channel

circuits each employing a series connected diode and neon lamp, a flicker elimination circuit comprising:

a DC potential source coupled to each one of said parallel-coupled signal channel circuits; and



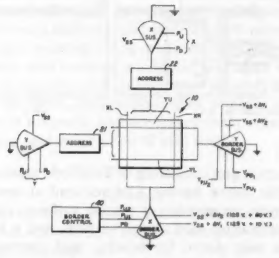
an AC potential source coupled to each one of said parallel-coupled signal channel circuits, said AC potential superimposed upon the applied DC potential and having a frequency greater than the flicker threshold of the human eye and providing an AC current not greater than the DC current provided by said DC potential source whereby discernible flicker of said neon lamp is eliminated.

3,894,263

BORDER SUSTAINER GENERATOR SYSTEM FOR GAS DISCHARGE DISPLAY PANELS

David S. Wojcik, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 9, 1972, Ser. No. 233,122
Int. Cl. G08b *5/36*
U.S. Cl. 315—169 TV **2 Claims**



1. In a gaseous discharge display panel having row-column conductor arrays non-conductively coupled to a gas discharge medium in a chamber space between said row and said column conductor arrays, sustaining generator means for supplying sustaining potentials to the row-column conductors locating information display sites in the panel and border row and column conductor arrays cooperating with each other and the ends of the conductors in the row-column conductor arrays to define border sites which, for the purpose of photon conditioning of information display sites in the panel, are on during the entry of information to be displayed on said panel, separate border sustainer generator means for said border row and column conductor arrays, the improvement in said border sustainer which comprises,

direct current power supply means supplying at least a pair of separate voltage levels to a pair of output terminals, said pair of output terminals being connected to said power supply means, one of said voltage levels being of an amplitude sufficient to initiate discharges in said panel and the other of said voltage levels being sufficient to maintain a sequence of discharges, once initiated, but of a magnitude insufficient to initiate a discharge,

each said separate sustainer generator including at least a pair of pull up switch circuits (PU_1 PU_2) and one pull down switch circuit (PD), a point in each said pull up circuits and said pull down circuit being commonly connected to supply an output border sustainer potential to the border conductors respectively of said panel.

means connecting said power supply output terminals to individual ones of said pull up circuits,

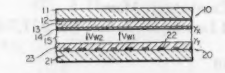
and control means connected to said pull up and pull down switch circuits for individually activating said pull up and pull down circuits to first initiate a sequence of discharges in said border sites at the higher-one of said voltage levels and then to sustain said sequence of discharges at another of said voltage levels.

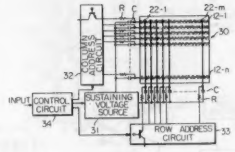
3,894,264

METHOD FOR DRIVING A PLASMA DISPLAY PANEL

Shizuo Andoh, Kobe; Kenji Murase; Toshiaki Iemori, both of Kakogawa; Hiroshi Yamamoto, Ashiya, and Norihiko Nakayama, Kobe, all of Japan, assignors to Fujitsu Limited, Japan

Filed Dec. 19, 1973, Ser. No. 426,020
Claims priority, application Japan, Dec. 29, 1972, 48-1117
Int. Cl. H05b *37/00*
U.S. Cl. 315—169 TV **3 Claims**





1. A method of driving a plasma display panel which includes a first member and a second member which are provided facing each other via a gap filled with ionizable gas, said first member providing a plurality of first electrodes which are covered with a first dielectric layer having a first surface contacting said ionizable gas, said second member providing a plurality of second electrodes which are covered with a second dielectric layer having a second surface contacting said ionizable gas, said second surface having secondary electron radiation emissivity higher than that of said first surface, and said first electrodes being provided in a direction which crosses said second electrodes,

said method of driving said plasma display panel comprising the steps of

applying an alternating sustaining voltage between said first electrodes and said second electrodes,

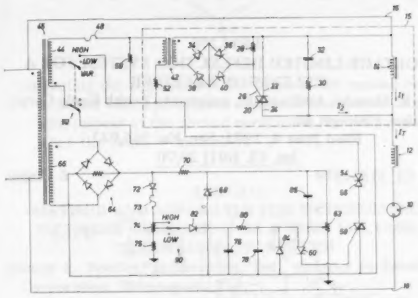
applying a write voltage between electrodes which are selected from said first electrodes and electrodes which are selected from said second electrodes having a polarity such that said second electrodes covered with said second dielectric layer having a surface of higher secondary electron emissivity have a negative polarity and said first electrodes covered with said first dielectric layer having a surface of lower secondary electron emissivity have a positive polarity,

thereby producing a discharge at the crosspoint of said first electrodes and said second electrodes across said gap filled with ionizable gas.

3,894,265
HIGH INTENSITY LAMP DIMMING CIRCUIT

Kenneth P. Holmes, Houston, and Carl R. Snyder, Alief, both of Tex., assignors to Esquire, Inc., New York, N.Y.

Filed Feb. 11, 1974, Ser. No. 441,429
Int. Cl. H05b *41/38*
U.S. Cl. 315—194 **29 Claims**



1. In combination with a high intensity gas discharge lamp, a dimmer circuit for controlling the brightness thereof, comprising:

ballast means connected to the lamp and connectable to an ac power distribution line;

said ballast means including a reactor portion,

gated bypass means for providing at least partial bypass of current around said reactor portion of said ballast means;

isolation means connected to said gated bypass means; and

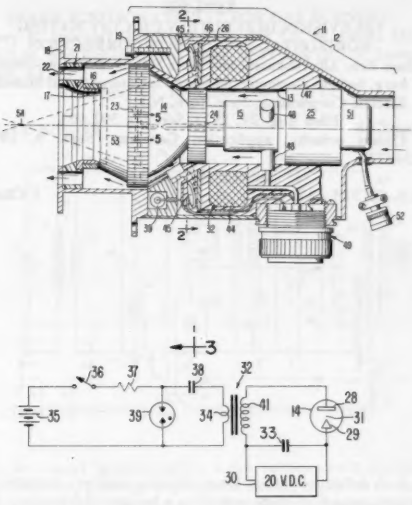
controllable gas source voltage means operably connected through said isolation means to said gated bypass means for controllably rendering said gated bypass means conductive, and thereby bypassing said reactor portion of said ballast means.

3,894,266
COMPOSITE IGNITOR AND ARC LAMP HOLDER ASSEMBLY

Jesse A. Souza, San Jose, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Mar. 30, 1973, Ser. No. 346,536
Int. Cl.[2] **H01J** *7/26;* **H05B** *37/00*
U.S. Cl. 315—227 **17 Claims**

1. An arc lamp housing which comprises generally cylindrical wall means comprising an inner wall surface and an outer wall surface, said inner wall surface forming a duct, electrical socket means being disposed within said duct for receiving a mating portion of an arc lamp, optical window means located within the duct of said housing, said optical window means being positioned so as to transmit light originating within said housing to the outside of said housing, arc lamp igniting means being disposed between said inner and outer wall surfaces, electrically conductive means extending from said igniting means into said duct for electrically connecting said igniting means to said socket, and means for causing a fluid to pass

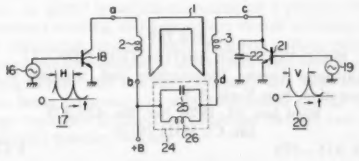


through said duct to cool said arc lamp during operation of said arc lamp.

3,894,267
CONVERGENCE CORRECTION DEVICE

Shuzo Matsumoto, and Ryoichi Hirota, both of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 27, 1973, Ser. No. 391,847
Claims priority, application Japan, Aug. 25, 1972, 47-84598
Int. Cl. H01j *29/70, 29/76*
U.S. Cl. 315—368 **8 Claims**



1. A convergence correction device comprising a horizontal convergence correction coil; a vertical convergence correction coil; a core on which the horizontal and the vertical convergence correction coils are disposed so as to cause substantially the same magnetic flux to link with both the coils; a first current source providing a correcting current having the horizontal scanning period connected to the terminals of the horizontal convergence correction coil; a second current source providing a correcting current having the vertical scanning period connected to the terminals of the vertical convergence correction coil; and a circuit connected in series with one of the series circuit of the horizontal convergence correction coil and the first current source and the series circuit of the vertical convergence correction coil and the second current source, the circuit having a high impedance at the frequency of the correcting current from the current source which is not connected with the circuit but a low im-

pedance at the frequency of the correcting current from the current source which is connected in series with the circuit.

3,894,268

TELEVISION DEFLECTION CIRCUIT HAVING HORIZONTAL PINCUSHION CORRECTION

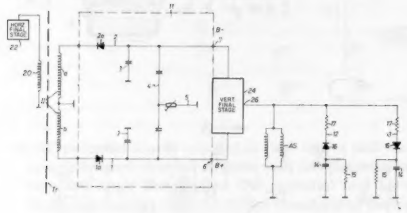
Klaus Reh, Albershausen, and Peter Schulz, Esslingen-Hegensberg, both of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 29, 1973, Ser. No. 392,603

Claims priority, application Germany, Sept. 9, 1972, 2244277

Int. Cl. H01j *29/56*

U.S. Cl. 315—371 **5 Claims**



1. A deflection circuit for a television receiver, comprising:

a horizontal final stage providing a horizontal-frequency a.c. output;

a vertical final stage providing a vertical-frequency a.c. output;

a supply circuit disposed between the horizontal final stage and the vertical final stage for providing power to the vertical final stage from the horizontal final stage, said supply circuit including

means for rectifying and filtering the a.c. output from the horizontal final stage so as to remove the horizontal frequency, said filter means being tuned so that the current flowing in the supply circuit oscillates at the vertical frequency, whereby the current flowing in the supply circuit directly modulates the current flowing in the horizontal deflection circuit and provides horizontal pincushion correction.

3,894,269

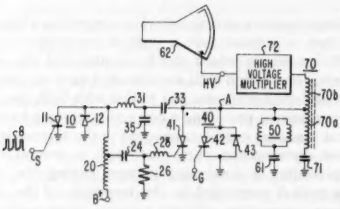
HIGH VOLTAGE PROTECTION CIRCUIT

Paul Raymond Ahrens, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 31, 1974, Ser. No. 438,325

Int. Cl. H01j *29/70*

U.S. Cl. 315—379 **6 Claims**



1. A high voltage protection circuit for reducing a high voltage supplied to a kinescope and rendering the kinescope display unviewable when the high voltage exceeds a predetermined level, comprising:

a deflection winding;

a high voltage generator for generating signals in response to current flow therein and for rectifying said signals for producing said high voltage;

deflection current generating means coupled to said deflection winding and to said high voltage generator for generating deflection current in said deflection winding and said current flow in said high voltage generator, said deflection current generating means, including bidirectionally conductive switching means conducting in a first direction for supplying scanning current to said deflection winding and conducting in an opposite direction when the voltage across said switching means tending to promote said current flow in said opposite direction exceeds a predetermined switching voltage, for altering said current flow in said high voltage generator and reducing said generated signals thereby limiting said high voltage.

3,894,270

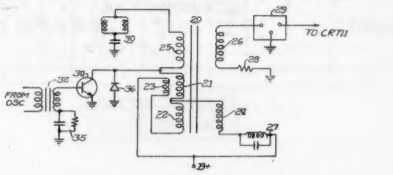
VOLTAGE-LIMITED DEFLECTION SYSTEM FOR A TELEVISION RECEIVER

Hans E. Manske, Addison, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed June 4, 1973, Ser. No. 366,943

Int. Cl. H01j *29/70*

U.S. Cl. 315—379 **6 Claims**



1. A television receiver including: a picture tube and associated deflection apparatus, said tube requiring a high DC potential; a tuned sweep transformer supplying appropriate currents to said deflection apparatus; high voltage amplifying and rectifying means for producing said high DC potential from the output of said tuned sweep transformer, said transformer having an output voltage generating capability, in the event of failure occurring in any of the components associated therewith, which is in excess of a predetermined safe level; a source of B+ potential; and tuning capacitance means having electrodes DC connected between said source and said transformer whereby in the event of failure of said capacitance, the voltage generated by said sweep transformer decreases.

3,894,271

METHOD AND APPARATUS FOR ALIGNING ELECTRON BEAMS

Hans C. Pfeiffer, Ridgefield, Conn., and Ollie C. Woodard, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 31, 1973, Ser. No. 393,365

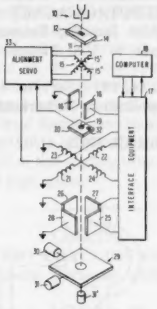
Int. Cl. H01j *29/52*; **B23k** *9/00*

U.S. Cl. 315—384 **17 Claims**

1. In a method of precisely positioning a beam of charged particles including continuously moving the beam through a predetermined path and periodically blanking the beam by deflecting the beam to intercept a blanking plate at a first predetermined position offset from a central aperture in the blanking plate, the improvement of precisely aligning the beam of charged particles with respect to said central aperture during those times when the beam is blanked to correct for instabilities due to lateral beam drift, comprising:

deflecting the beam toward a second predetermined position on the blanking plate offset from the central aperture;

sensing the error in alignment of the beam at the second predetermined offset position; and



correcting the alignment of the beam at the second predetermined offset position to cause the beam to be aligned with respect to the central aperture in the blanking plate when the beam is unblanked.

3,894,272

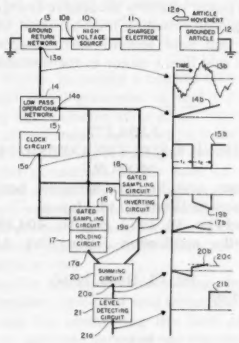
METHOD AND APPARATUS FOR DETERMINING INCIPIENT GROUNDING OF A HIGH VOLTAGE ELECTROSTATIC SYSTEM

Stanley L. Bentley, Indianapolis, Ind., assignor to Ransburg Corporation, Indianapolis, Ind.

Division of Ser. No. 433,265, Jan. 14, 1974, Pat. No. 3,851,618. This application Aug. 16, 1974, Ser. No. 498,088

Int. Cl.[2] B05B *5/02;* **H02H** *3/16, 7/00*

U.S. Cl. 317—3 **11 Claims**



1. A method of determining incipient grounding of the high voltage electrode in an electrostatic coating system, including a high voltage source, a charged high voltage electrode and a grounded article comprising

sensing the electrical current returning from ground to the high voltage source and developing a signal with a component related to an incipient grounding condition;

splitting the developed signal into two channels;

independently operating on the developed signal in each of the two channels to develop different signal components at the channel outputs;

combining the different signal components to develop the component relating to an incipient grounding condition, and detecting the level of the signal component relating to incipient grounding.

3,894,273

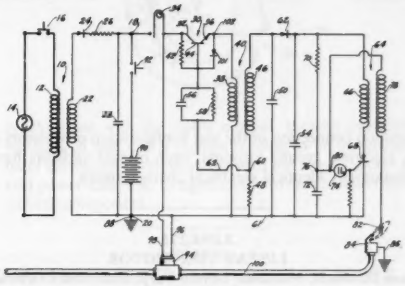
SPARK IGNITION CIRCUIT FOR GAS BURNERS

Harry E. Newport, Jr., 9400 High Hill Ct., St. Louis, Mo. 63126, and Robert L. Baysinger, 9547 Alix Dr., St. Louis, Mo. 63123

Filed May 17, 1974, Ser. No. 470,712

Int. Cl. F23q *3/00*

U.S. Cl. 317—96 **8 Claims**



1. In a spark ignition circuit, a low voltage direct current power source, a storage capacitor, a pulsing oscillator circuit operating on said power source and operative to incrementally charge said storage capacitor to a considerably higher voltage than said power source, said oscillator circuit comprising a transistor having its collector-emitter circuit connected across said power source, starting means, a transformer having a primary winding in the output of said transistor and a secondary winding of considerably greater inductance than said primary winding, parallel resistance-capacitance means connected between one end of said secondary winding and the base of said transistor and operative to drive said transistor to saturation and to abruptly cut off said transistor at saturation, thereby to effect an induced high voltage pulse in said secondary winding, circuit means including impedance means connecting the other end of said secondary winding to a point of fixed potential, and circuit means including a diode connecting said storage capacitor in parallel with said impedance means, an igniter transformer comprising a primary winding, a secondary winding, and a secondary circuit including spaced spark electrodes, circuit means including voltage responsive switching means connecting said igniter transformer primary winding across said storage capacitor, and said switching means being responsive to a predetermined charge on said storage capacitor to effect its discharge through said igniter transformer primary winding.

3,894,274

ELECTRIC MOTOR TRANSIENT VOLTAGE SUPPRESSING CIRCUIT

George Mowry Rosenberry, Jr., Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.

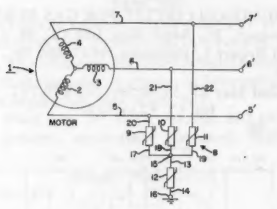
Filed July 1, 1974, Ser. No. 485,056

Int. Cl. H02h *7/09*

U.S. Cl. 317—13 R **7 Claims**

1. An electric distribution system having a plurality of electrical conductors equal in number to N that are to be protected from transient voltages, in combination with a transient voltage suppressing circuit comprising a plurality of metal oxide varistors equal in number to N plus 1, all but one of said varistors being connected in a star configuration with one of the respective terminals of each star-connected varistor being electrically connected in common, electric conductor means connecting each conductor, respectively, of the N conductors of the distribution system to an associated outer varistor ter-

minal of the star configuration of varistors, the remaining varistor being electrically connected in series between the

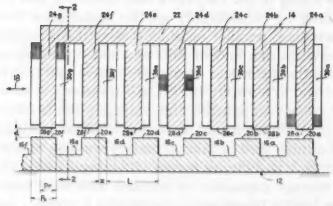


common connection of the star configuration of varistors and an electrical ground terminal, each of said varistors having substantially identical electrical characteristics.

3,894,275
LINEAR STEP MOTOR

Hans Baumans, Montreal; Gerald Turp, Dollard des Ormeaux, and Huy Phan Van, Saint-Leonard, all of Canada, assignors to Centre de Recherche Industrielle du Quebec, Ste-Foy, Canada

Filed Dec. 11, 1973, Ser. No. 423,811
Int. Cl. H02k *41/02*
U.S. Cl. 318—38 **9 Claims**

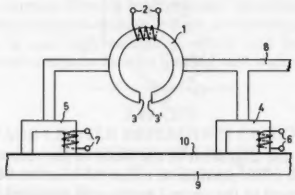


1. In a linear step motor having an active armature and a passive armature in spaced juxtaposition to one another, said passive armature consisting of a plate member of magnetic permeable material including a plurality of equally spaced pole faces of identical width; said active armature consisting of a core of magnetic permeable material including a series of parallel equally spaced pole pieces defining at one end thereof pole faces of identical width; the spacing between the pole faces of said active armature being equal to the spacing between the pole faces of said passive armature; the width of the pole faces of said active armature differing from the width of the pole faces of the passive armature by a step value proportional to the number of pole pieces on the active armature; excitation winding means on each of said pole pieces; and means for selectively energizing said winding means in sequence and in pairs whereby the magnetic field created when a pair of winding means is energized by digital control pulses produces magnetomotive forces between the associated pole faces of said active and passive armatures resulting in the non-continuous displacement of the active armature in a position of maximum magnetic flux, an indexing force being provided between said armatures at standstill during the energization of said winding means and after the step displacement of said active armature.

3,894,276
LINEAR STEPPING MOTOR USING TWO RETAINING ELECTROMAGNETS AND A DEFORMABLE ELECTROMAGNET

Peter Johannes Michiel Janssen, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 14, 1974, Ser. No. 442,502
Claims priority, application Netherlands, Mar. 2, 1973, 7302941
Int. Cl. H02k *41/02*
U.S. Cl. 318—135 **10 Claims**

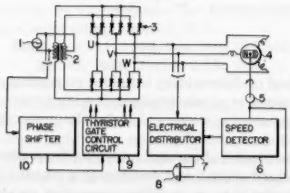


1. A linear motor comprising a first electromagnetic retaining member, a second electromagnetic retaining member, a magnetically permeable surface proximate said first and second electromagnetic retaining members whereby motion of said retaining members is selectively retarded by energizing said electromagnetic retaining members, an electromagnetic sliding element comprising an electromagnet having a pair of oppositely arranged poles separated by a gap on one side of said sliding element, an elastic coupling on another side of said sliding element, said gap being selectively narrowed in response to energization of said sliding element electromagnet, means for mechanically connecting one of said poles to said first electromagnetic retaining member, and means for connecting said second electromagnetic retaining member to another of said poles, whereby successive energization of said first electromagnetic retaining member, said sliding element electromagnet and said second electromagnetic retaining member moves said linear motor in the direction of said gap motion.

3,894,277
CONTROL DEVICE FOR THE COMMUTATORLESS MOTOR

Kyozo Tachibana, and Yoshio Okumura, both of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 10, 1973, Ser. No. 404,893
Claims priority, application Japan, Oct. 13, 1972, 47-102486
Int. Cl. H02k *29/00*
U.S. Cl. 318—138 **7 Claims**



1. A control device for a commutatorless motor comprising:
a synchronous motor;
a thyristor power converter for supplying electric power to said synchronous motor;
control means for supplying control signals to the gates of said thyristor power converter; and distributing means for

providing an advance angle of distribution signal to said control means, said distributing means including distribution signal means for maintaing an advance angle of said distribution signal at a small value during the starting time of the motor, said distribution angle means maintaining the advance angle of said distribution signal at a constant value regardless of the motor speed when the motor speed is higher than a predetermined high speed, and said distribution signal means continuously changing the advance angle of said distribution signal in accordance with the motor speed in an intermediate speed range between the motor speed at the starting time of the motor and the predetermined high speed.

3,894,278

BATTERY CHECKING CIRCUIT

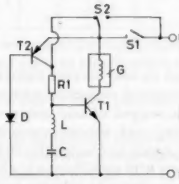
Erich Gerum, Nurnberg, Germany, assignor to Diehl, Nurnberg, Germany

Filed Feb. 6, 1974, Ser. No. 440,266

Claims priority, application Germany, Feb. 10, 1973, 2306545

Int. Cl.[2] H02J *7/00;* **H01M** *10/38*

U.S. Cl. 320—48 **18 Claims**



1. A circuit for checking the charge state of a battery of a battery operated device comprising in combination:

a pair of terminals connectable to the terminals of a battery;

a signal generator;

first circuit means, including a control transistor, for connecting said signal generator to said terminals and for controlling the operating state of said signal generator;

comparison circuit means, including a switching transistor connected to said control transistor and a reference voltage member connected to the base of said switching transistor, for comparing the voltage across said terminals with the reference voltage of said reference voltage member and for controlling the state of said control transistor in accordance with the voltage difference resulting from the comparison; and

switch means for selectively connecting the base of said control transistor to one of said terminals when in a first position, and for connecting the base of said control transistor to said one terminal via the emitter collector path of said switching transistor when in a second position to effect a battery check.

3,894,279

APPARATUS FOR SYNCHRONOUS SMOOTHING OF CURRENT RIPPLE

Edward P. Priebe, North East, Pa., assignor to General Electric Company, Erie, Pa.

Filed Jan. 4, 1974, Ser. No. 430,716

Int. Cl. H02m *1/14;* **H01f** *29/12*

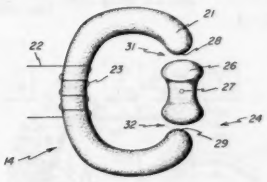
U.S. Cl. 321—10 **5 Claims**

1. An inductor device for minimizing the ripple current component of a rectified a-c power source connectable to energize a load, comprising:

a magnetic core having a variable air gap;

b. a coil on said magnetic core adapted to be serially connected intermediate the output of the rectified power source and said load; and

c. means for cyclically changing the geometry of said air gap and hence the flux linkage of said inductor device in



synchronism with the ripple current, thereby cyclically inducing in said coil a voltage tending to be in substantially inverse phase relationship with the ripple voltage of said power source so as significantly to reduce said ripple current component.

3,894,280

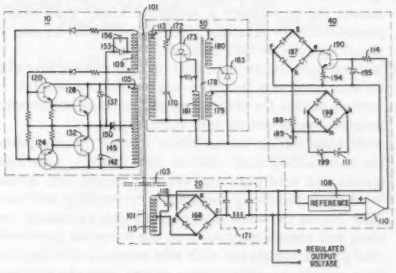
FREQUENCY LIMITED FERRORESONANT POWER CONVERTER

John Daniel Bishop, Morris Township, Morris County, N.J., and Ladislas George Kerenyi, Jr., Bronx, N.Y., assignors to Western Electric Company Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Apr. 2, 1974, Ser. No. 457,165

Int. Cl. H02m *3/32;* **G05f** *1/56*

U.S. Cl. 321—18 **6 Claims**

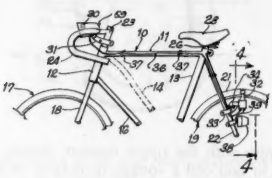


1. A DC to DC converter comprising an inverter circuit having positive and negative half-cycles of oscillation, said inverter circuit including a transformer having a primary winding, a control winding, and a ferroresonant output winding, and a pair of transistor switches connected in push-pull arrangement with said primary winding; and means for controlling the frequency of said inverter comprising a capacitor, feedback means connected from said output winding to said capacitor for charging said capacitor during each inverter half-cycle, switching means connected across said control winding and to said capacitor responsive to the capacitor voltage attaining a predetermined value for terminating said inverter half-cycle and for discharging said capacitor to a predetermined state, said feedback means comprising a controllable current source responsive to the output winding voltage to charge said capacitor in each half-cycle, and means for coupling said current source between said control winding and said capacitor, said controllable current source including means for limiting the charging current applied to said capacitor in each inverter half-cycle whereby the maximum inverter frequency is fixed.

3,894,281
BATTERY AND GENERATOR VEHICLE LIGHTING SYSTEM

Alan M. Bloomfield, Des Plaines, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.

Filed Jan. 21, 1974, Ser. No. 434,997
Int. Cl. B62j 5/00
U.S. Cl. 322—1 9 Claims



1. A velocity responsive battery and generator lighting system for a vehicle having a member rotatable at a velocity related to the speed of the vehicle, comprising:

a. generating means for generating electricity mounted on said vehicle adjacent said member and selectively switchable between an operating mode and an inoperable mode with respect to said member, said generating means being operable in said operating mode to generate a first predetermined potential in response to said member rotating at a velocity above a predetermined velocity,

b. first light means mounted on said vehicle and electrically connected with said generating means, said first light means being energized in response to said generating means generating said first predetermined potential,

c. potential dividing means operable with said generating means for generating a potential lower than said first predetermined potential and proportional to the rotational velocity of said member,

d. second light means mounted on said vehicle operable to be energized at a second predetermined potential,

e. battery means for protruding said second predetermined potential mounted on said vehicle, and

f. solid state circuit means being free of moving parts for interconnecting said second light means, said battery means and said potential dividing means and including solid state switching means for controlling said second light means between unenergized and energized conditions and means responsive to the potential generated by said generating means with said potential dividing means for controlling said switching means, whereby said second light means is unenergized upon said member rotating at a velocity above said predetermined velocity and said second light means is energized by said battery means upon said member rotating at a velocity lower than said predetermined velocity.

3,894,282
ADAPTIVE TIMING TEMPERATURE CONTROL CIRCUIT

Raymond W. MacFarland, Jr., Novelty, Ohio, assignor to Computron, Inc., Valley View, Ohio

Filed Feb. 2, 1973, Ser. No. 328,944
Int. Cl. G05d 23/01
U.S. Cl. 323—4 4 Claims

1. An adaptive timing temperature control circuit to control output to output means, comprising in combination,

power source means,

constant current generator means adapted to provide a constant current output at various current magnitudes,

means connecting said constant current generator means to said power source means to provide power for said constant current generator means

first switch means having a first and a second state,

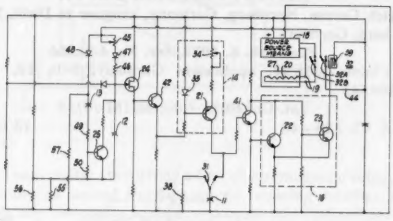
first capacitor means,

means connecting said first switch means and said first capacitor means to change the charge on said first capacitor means with a first magnitude of constant current from said constant current generator means when said first switch means is in said first state,

sensor means connected to said first capacitor means to produce an output when said first switch means is in said first state until the change in charge on said first capacitor means exceeds a predetermined value,

means connecting said sensor means to the output means to control output thereto in accordance with the output of said sensor means,

second capacitor means for storing a charge,



means connected to said second capacitor means for discharging said second capacitor means upon termination of the previous output of said sensor means,

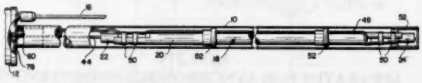
means connecting said second capacitor means to said power source means to change the charge on said second capacitor means with said change in charge in said second capacitor means being in relation to the duration since the previous output of said sensor means,

and means connecting said second capacitor means to said constant current generator means to provide a second current magnitude of said constant current generator means to said first capacitor means to vary the time required for said first capacitor means to have a change in charge exceeding said predetermined value whereby the duration of the output to the output means is varied in accordance with the elapsed time since the previous output thereto.

3,894,283
MAGNETIC LOCATOR INCLUDING SENSORS MOUNTED IN LONGITUDINAL GROOVES OF A TUBULAR SUPPORT

Erick O. Schonstedt, Reston, Va., assignor to Schonstedt Instrument Company, Reston, Va.

Filed Nov. 3, 1972, Ser. No. 303,598
Int. Cl. G01v 3/10; G01r 33/04
U.S. Cl. 324—3 9 Claims



1. Magnetic detecting apparatus comprising a tubular support of substantially circular cross-section having each end cut away along longitudinal and transverse planes at a side thereof, respectively, to form a longitudinal groove of substantially semi-circular cross-section at each end of the support, each groove having substantially parallel longitudinal edges in said longitudinal plane terminating at said transverse plane, and a substantially cylindrical magnetic sensor mounted in each groove, the cross-dimensions of the sensors being correlated with the cross-dimensions of the associated grooves, so

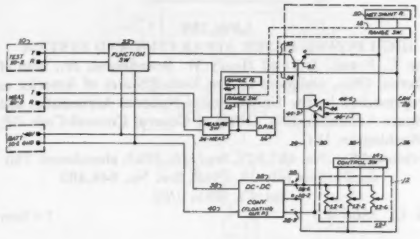
that each sensor has a snap-fit in the associated groove and is held snugly therein by the frictional embrace of the groove.

3,894,284

CURRENT FLOW TEST APPARATUS

Ralph Morrison, Pasadena, and Orrin B. O'Dea, Garden Grove, both of Calif., assignors to Communication Mfg. Co., Long Beach, Calif.

Filed Apr. 29, 1974, Ser. No. 465,350
Int. Cl. G01r *31/02*
U.S. Cl. 324—28 R **15 Claims**



1. Current flow test apparatus comprising:
a. first and second current input/output circuits for the test apparatus;
b. first and second power input circuits for the test apparatus;
c. an active current regulating circuit comprising a power supply input for receiving power therefor, first and second signal input/output circuits and a reference input, the regulating circuit having a D.C. isolation from the power input circuits and operative for regulating the level of current passing between the input/output circuits of the regulating circuit to a contant level corresponding to the level of the signal applied at said reference input;
d. a power supply having first and second input circuits, respectively, connected to said first and second power input circuits for receiving power and an output circuit coupled to the power supply input of said regulating circuit, said power supply providing electrical power to said regulating circuit and comprising means for providing a D.C. isolation between the output and input circuits of said power supply;
e. manually operable function switching means for selectively coupling the first and second input/output circuits of the regulating circuit, separately, to the first and second power input circuits and the first and second current input/output circuits of the test apparatus, in various combinations;
f. manually adjustable means for setting the signal at the reference input to various levels; and
g. a visual indicator for indicating current passing through said first and second input/output circuits of said current regulating circuit.

3,894,285

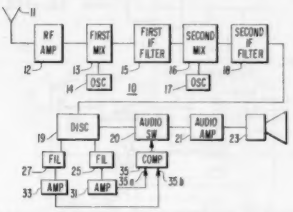
SPECTRUM DIFFERENTIAL NOISE SQUELCH SYSTEM

Louis Carl Schaeperkoetter, McMurray, Pa., assignor to RCA Corporation, New York, N.Y.

Filed June 24, 1974, Ser. No. 482,630
Int. Cl. H04b *1/10*
U.S. Cl. 325—348 **5 Claims**

1. A noise squelch system for use in a receiver of the type having a discriminator for detecting intelligence signals coupled to the output of a bandpass filter having upper and lower frequency 6 db points defining a frequency bandwidth comprising:

first means coupled to said discriminator output for sensing the noise level over a first band of baseband frequencies centered at a frequency lower than the value of said frequency bandwidth and second means coupled to said discriminator output for sensing the noise level over a second separate band of baseband frequencies centered at a frequency higher than the value of said frequency bandwidth, and



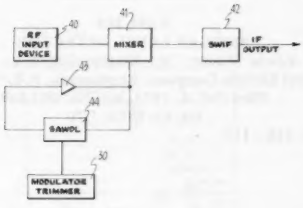
means including comparator means coupled between said first and second sensing means at the output of said discriminator for squelching the output signal from the discriminator when the difference in the noise levels over said first and second bands of baseband frequencies is below a given value, and for passing the output signal from the discriminator when said difference is above said given value.

3,894,286

TEMPERATURE COMPENSATED VOLTAGE TUNABLE CIRCUITS USING SURFACE WAVE DEVICES

Donald B. Armstrong, Belmont, Calif., assignor to Crystal Technology, Inc., Mountain View, Calif.

Filed Jan. 28, 1974, Ser. No. 437,275
Int. Cl.² H04B *1/26*
U.S. Cl. 325—438 **5 Claims**



1. A temperature compensated receiver, said receiver comprising:
input means for receiving RF signals having a frequency f_{RF};
a mixer having a first input coupled to said input means, and a second input,
a surface wave integratable filter having a temperature coefficient α_{IF}, said filter having an input coupled to said mixer and an output for furnishing intermediate frequency signals to an output terminal; and
a local oscillator coupled to said second input of said mixer, said local oscillator comprising an amplifier and a surface acoustic wave delay line coupled in a closed loop configuration, said surface acoustic wave delay line having a temperature coefficient α_{LO}, said temperature coefficients being selected to satisfy the relation $\alpha_{LO}f_{LO} = \alpha_{IF}f_{IF}$, where F_{LO} f_{IF} are the local oscillator and intermediate frequencies, respectively, when $f_{LO} > f_{FR}$: said temperature coefficients being selected to satisfy the relation $\alpha_{LO}f_{LO} = -\alpha_{IF}f_{IF}$ when $_{LO}f < f_{RF}$.

3,894,287
TIME DELAY CIRCUIT FOR MODEMS

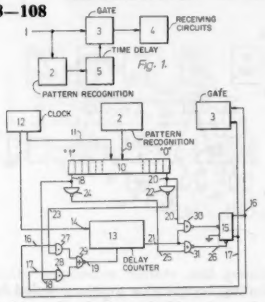
Odd Mathiesen, Oslo, Norway, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 24, 1974, Ser. No. 436,241

Claims priority, application Norway, Apr. 13, 1973, 1543/73

Int. Cl. H03k *5/20*

U.S. Cl. 328—108 **3 Claims**



1. A time delay circuit for switching on and off a modem designed to handle multiple data transmission speeds comprising:

a signal pattern recognition circuit;

an up/down shift register coupled to said pattern recognition circuit for registering signals representative of information signals and signals representative of non-information signals;

a delay counter responsive to the contents of said shift register for initiating a predetermined delay at the initial occurrence of an information signal or a non-information signal; and

a gating circuit coupled to said shift register and said delay counter for switching on said modem if only information signals have been received during the delay time and for switching off said modem if only non-information signals have been received during the delay time.

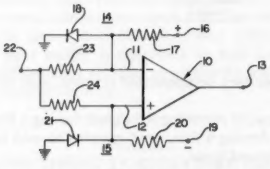
3,894,288
BIPOLAR LEVEL DETECTOR

Claude Edwin Musser, Jr., Binghamton, N.Y., assignor to General Electric Company, Binghamton, N.Y.

Filed Oct. 4, 1973, Ser. No. 403,469

Int. Cl. H03k *5/20*

U.S. Cl. 328—115 **7 Claims**



1. A bipolar level detector comprising:

a. an operational amplifier having inverting and non-inverting input terminals and an output terminal;

b. biasing networks coupled to said inverting and non-inverting inputs, each of said biasing networks includes a source of reference voltage, a resistor and diode connected in series between the source of reference voltage and a point of reference potential, the reference voltages being of opposite polarity so that the diodes in each network are conducting thereby establishing bias voltages of opposite polarity at the junction of the diode and resistor in the respective networks;

c. an input terminal adapted to receive bipolar signals;

d. means coupling said input terminal to said biasing networks for disabling one of said networks and applying a voltage of the proper polarity and amplitude to override the effect of the other network if an input signal of one polarity exceeds a predetermined level, and for disabling the other network and overriding the effect of said one network if an input signal of the opposite polarity exceeds a predetermined level whereby the output of said amplifier is switched to saturation of the opposite polarity whenever the input signal, of either polarity, exceeds its predetermined level.

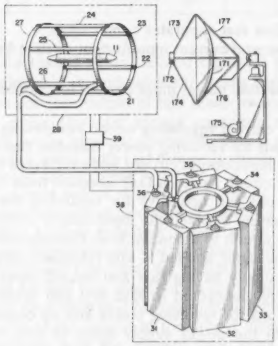
3,894,289
HIGH POWER LASER APPARATUS AND SYSTEM

John C. Evans, Jr., and Henry W. Brandhorst, Jr., both of Berea, Ohio, assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Office of General Counsel-Code GP, Washington, D.C.

Division of Ser. No. 487,929, Sept. 16, 1965, abandoned. This application July 29, 1968, Ser. No. 848,403

Int. Cl. H01s *3/09*

U.S. Cl. 330—4.3 **1 Claim**



1. A high power transmission system comprising

a laser for transmitting a beam of coherent light, said laser including

a rod of a laser material,

a plurality of gaseous discharge lamps for pumping said rod,

a capacitor electrically connected to each of said discharge lamps,

triggering circuit means for providing a high voltage,

first switching means for selectively connecting the triggering means to one of said discharge lamps,

power supply means, and

second switching means for electrically connecting the power supply means to all but one of said capacitors, said first switching means being mechanically coupled to said second switching means whereby said capacitor not connected to said power supply means is electrically connected to said discharge lamp which is electrically connected to said triggering circuit means,

a parabolic reflector spaced apart from said laser for collecting the beam of coherent light emitted from the transmitter,

a photovoltaic device for converting said beam of collected coherent light into electrical energy, and

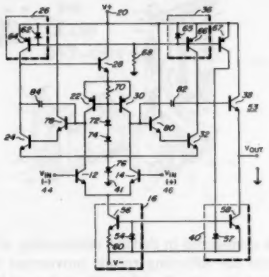
means for cooling the laser, parabolic reflector, and the photovoltaic device.

3,894,290

BALANCED DOUBLE-TO-SINGLE-ENDED CONVERTER STAGE FOR USE WITH A DIFFERENTIAL AMPLIFIER

John A. Schoeff, Mesa, assignor to Motorola, Inc., Chicago, Ill.

Filed June 15, 1973, Ser. No. 370,518
Int. Cl. H03f 3/04
U.S. Cl. 330—14 19 Claims



1. In a circuit having a balanced signal source providing a balanced signal between first and second electrodes thereof, a balanced-to-unbalanced converter suitable for transforming the balanced signal into an unbalanced signal at an output terminal thereof and for applying substantially the same active loads to the first and second electrodes of the balanced signal source, the balanced-to-unbalanced converter including in combination:

power supply connecting means for providing voltage potentials, said power supply connecting means having an output terminal and a reference terminal;

first active load means for providing an active load to the first electrode of the balanced signal source, said first active load means having a first terminal coupled to the first electrode of the balanced signal source, a second terminal coupled to said output terminal of said power supply connecting means, a third terminal coupled to said reference terminal of said power supply connecting means, and an output terminal, said first active load means being responsive to said voltage potentials to provide an active impedance having first predetermined electrical characteristics to the first electrode of the balanced signal source; and

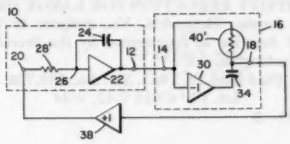
second active load means for providing an active load to the second electrode of the balanced signal source, said second active load means having a first terminal coupled to the second electrode of the balanced signal source, a second terminal coupled to said output terminal of said power supply connecting means, a third terminal coupled to said reference terminal of said power supply connecting means, a fourth terminal coupled to said output terminal of said first active load means, and a fifth terminal providing the output terminal of the balanced-to-unbalanced converter, said second active load means being responsive to said voltage potentials to provide an active impedance having second predetermined electrical characteristics to the second electrode of the balanced signal source, said second predetermined electrical characteristics being substantially the same as said first predetermined electrical characteristics of said first active load means to cause substantially equal active impedances to be applied to the first and second electrodes of the balanced signal source.

3,894,291

PRECISION TWO-PHASE ELECTRON OSCILLATOR EMPLOYING AN ALL-PASS NETWORK HAVING MEANS FOR ADJUSTING ITS TIME CONSTANT AS A FUNCTION OF THE AMPLITUDE OF THE OSCILLATING VOLTAGE

Arthur Mayer, Kew Gardens, N.Y., assignor to Astrosystems, Inc., Lake Success, N.Y.

Filed Feb. 15, 1973, Ser. No. 332,759
Int. Cl.² H03B 3/02, 5/20, 27/00
U.S. Cl. 331—45 4 Claims



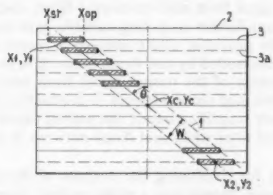
1. An electronic oscillator comprising an integrator having input and output terminals; and an all-pass network having an input terminal coupled to the output terminal of said integrator and an output terminal coupled to the input terminal of said integrator, said all-pass network including means for adjusting the time constant thereof as a function of the amplitude of an oscillating voltage generated by said oscillator, said oscillator generating voltages at said input and output terminals of said integrator which are in precise phase quadrature and precisely matched in amplitude.

3,894,292

DISPLAY APPARATUS

Brian Wilkinson, Rainham; David John Jibb, Chatham, and Martin Neil Smith, Rochester, all of England, assignors to Elliott Brothers (London) Limited, Chelmsford, England

Filed Mar. 7, 1973, Ser. No. 338,842
Claims priority, application United Kingdom, Mar. 10, 1972, 11275/72
Int. Cl. G08b 5/36
U.S. Cl. 340—324 AD 8 Claims



1. Display apparatus in which the display comprises a raster of parallel lines and a symbol is displayed by changing a visual parameter of one or more selected portions of the raster lines comprising:

a. cyclic digital counter means operating in synchronism with the raster line scan so that successive counts of the counter correspond to successive sections of each raster line, thereby notionally dividing each raster line into sections respectively corresponding to different counts of the counter;

b. means for producing digital outputs defining the position of each raster line portion required to be selected to display a required symbol, in accordance with the notional numbering of sections of the raster lines effected by the counter means;

c. an output circuit comprising means for comparing said digital output with the output of the counter means to produce an output signal for changing said visual parameter when there is correspondence between said digital outputs and the output of the counter means; and

d. delay means connectable to delay the output of said output circuit by a fraction of the period between successive counts of the counter means when a said digital output fractionally exceeds the corresponding count of the digital counter by a predetermined amount, thereby to effectively increase the number of sections into which each raster line is notionally divided.

3,894,293

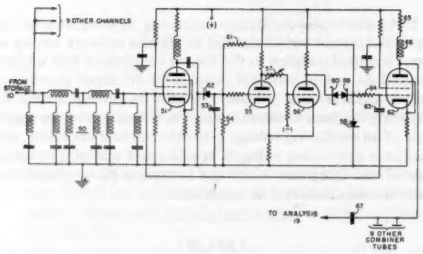
OBJECT LOCATOR SYSTEM WITH AUTOMATIC SENSITIVITY REDUCTION FOR LARGE SIGNALS

Garold K. Jensen, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 29, 1963, Ser. No. 255,726

Int. Cl.[2] G01S *9/42, 9/44*

U.S. Cl. 343—8 **2 Claims**



2. In a velocity sensitive type radar system,

a plurality of frequency selective filters for separating on a basis of frequency the radar return signals which are shifted in frequency as a result of motion of objects producing the return signals,

a plurality of variable gain signal transmission means, one for each filter and each individually connected to a filter, each transmission means including a diode network which is conductive only in response to a small amplitude output signal from said connected filter, each transmission means further including variable gain amplification means for providing said transmission means output signal and controlled by said diode network to provide large amplification of the output signal from said connected filter when said diode network is conductive and to provide lesser amplification of the output signal from said connected filter when said diode network is not conductive

and means for combining the outputs of the plurality of transmission means into a single output channel for the radar system indicator.

3,894,294

FLAT TORQUE RATE DRIVE SYSTEM

Igor Blinow, Millis, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 24, 1972, Ser. No. 246,715

Int. Cl. G03b *19/12*

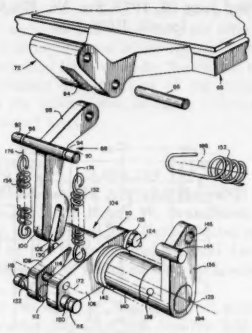
U.S. Cl. 354—158 **5 Claims**

1. In combination with a reflex photographic camera of the type having operator means movable between a viewing position and an exposure position, apparatus including:

erecting means coupled with said operator means and actuable to move said operator means between said viewing and said exposure positions;

drive spring means for providing a rotational output of uniform torque characteristic;

actuator means driveably engageable with said erecting means and operatively connected to and responsive to said drive spring means for actuating said erecting means to move said operator means from one of said positions to the other of said positions; and



means connected in driving relationship with said actuator means for effecting return movement of said operator means to one of said positions by said erecting means whilst storing energy in said drive spring means.

3,894,295

SOLID STATE IMAGE DISPLAY AND/OR CONVERSION DEVICE

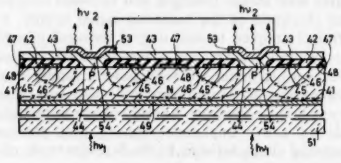
John Martin Shannon, and John Ernest Ralph, both of Salfords, near Redhill, England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 18, 1973, Ser. No. 398,480

Claims priority, application United Kingdom, Sept. 22, 1972, 43958/72; Sept. 22, 1972, 43956/72; Aug. 16, 1973, 43957/73

Int. Cl. H01l *15/00*

U.S. Cl. 357—19 **13 Claims**



1. An imaging display or converter device comprising a common semiconductive layer having opposed major surfaces, an array of junction field effect transistors each having source and drain regions spaced apart by a channel region and each having a separate gate spaced by a barrier junction from a channel region and capable when pulsed of establishing a depletion region in the channel, said channel regions all being located in the said common semiconductive layer, an array of display elements each capable when traversed by electrical current of generating radiation capable of exiting from the device, each of said display elements being electrically connected in series with the source and drain regions of one of the transistors, said array of transistors being mounted such that electromagnetic radiation in the form of an image directed fromoutside from outside array can reach the channels and generate charge carriers in or within a diffusion length of said depletion regions thereby causing contraction thereof in accordance with the intensity of the radiation incident thereon, and means for applying a potential across the array of transistors and array of display elements.

DESIGN PATENTS

GRANTED JULY 8, 1975

ERRATA

For CLASS	See PATENT NO.
057-001.E	235,800

DESIGNS

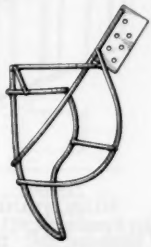
JULY 8, 1975

235,699
INFLATABLE FOOTBALL SHOULDER CUSHION
Munro M. Grant, 3 Bluebell Ave., 212 Vanderbuilt Tower II, Naples, Fla. 33940
Filed Nov. 2, 1973, Ser. No. 412,183
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—27

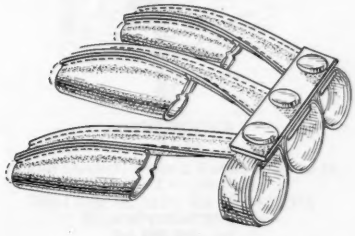
235,700
SPORT SHOE
Jonas Senter, Oakley Lane, Greenwich, Conn. 06830
Filed June 18, 1974, Ser. No. 480,534
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—311

235,701
SHOE SOLE
Joseph P. Famolare, Jr., Florence, Italy, assignor to Famolare, Inc., New York, N.Y.
Filed May 28, 1974, Ser. No. 473,336
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—319

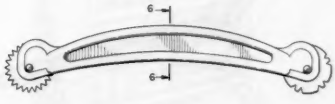
235,702
FACE GUARD FOR A HELMET
Dennis L. Burns, 4044–A NE. 109th St., Seattle, Wash. 98125
Filed Feb. 5, 1973, Ser. No. 329,467
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—233



235,703
DISASSEMBLABLE ARCHERY FINGER TAB
George D. Birnie, Pine Bluff, Ark., assignor to Brunswick Corporation
Filed Feb. 28, 1973, Ser. No. 336,541
Term of patent 14 years
Int. Cl. D2—
U.S. Cl. D2—361



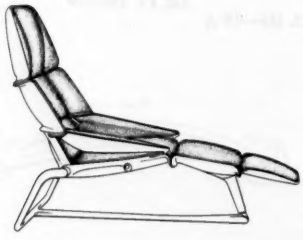
235,704
TRACING WHEEL
Else Tyroler, 1543 S. Robertson, Los Angeles, Calif. 90048
Filed Oct. 11, 1973, Ser. No. 405,715
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D3—19 A



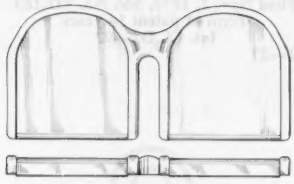
235,705
INFANT'S DRESSING TABLE
Raymond G. Pierson, 120 Simson St., Bedford, Pa. 15522
Filed Oct. 29, 1973, Ser. No. 410,518
Term of patent 7 years
Int. Cl. D6—*04*
U.S. Cl. D6—5

235,706
MUSIC STAND
Neil Douglas Pennington, 622 Braeside Road, Baltimore, Md. 21229
Filed Jan. 24, 1974, Ser. No. 436,172
Term of patent 3½ years
Int. Cl. D6—*99*
U.S. Cl. D6—18

235,707
ADJUSTABLE LOUNGE CHAIR
Warren Platner, Foote's Bridge Road, Guilford, Conn. 06340
Filed Aug. 27, 1973, Ser. No. 391,762
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—38

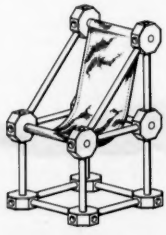


235,708
SKI LIFT SEAT
Scott D. Miller, 1348 SW. Taylors Ferry Road, Portland, Oreg. 97219, and Charles W. Kellogg, Jr., P.O. Box 663, Battleground, Wash. 98604
Filed Sept. 21, 1973, Ser. No. 399,429
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—59



235,709
STACKING CHAIR
Robert W. Schier, Glenview, Ill., assignor to American Seating Company, Grand Rapids, Mich.
Filed Oct. 1, 1973, Ser. No. 402,118
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—66

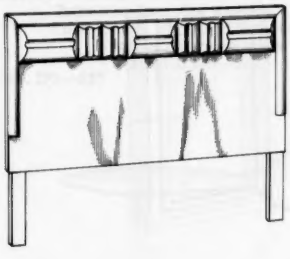
235,710
CHAIR
Allen L. Hall, Provo, Utah
(10338 Larwin Ave., Chatsworth, Calif. 91311)
Filed Oct. 31, 1973, Ser. No. 411,485
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—68



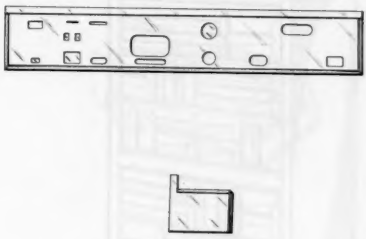
235,711
CHAIR
Hugh C. Acton, Augusta, Mich., assignor to American Seating Company, Grand Rapids, Mich.
Filed Aug. 20, 1973, Ser. No. 389,686
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69

235,712
CHAIR
Harry Laylon, Syracuse, N.Y., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Mar. 2, 1973, Ser. No. 337,710
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—70

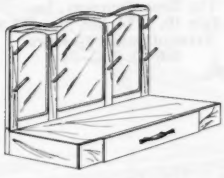
235,713
BED HEADBOARD
Aaron Donner, Weston, Conn., assignor to The Lane Company, Inc.
Filed July 10, 1974, Ser. No. 487,378
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—79



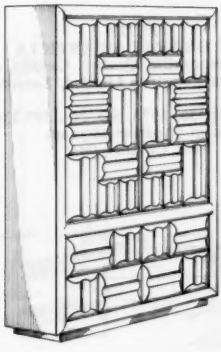
235,714
RACK FOR TOOTHBRUSHES AND TOILETRIES OR THE LIKE
Harry Lesser, Jr., Clayton, Mo., assignor to Halame Company, St. Louis, Mo.
Filed Nov. 13, 1972, Ser. No. 306,328
Term of patent 7 years
Int. Cl. D6—*06*
U.S. Cl. D6—94



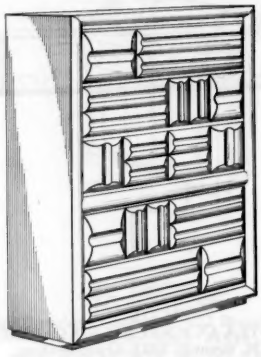
235,715
COFFEE-TEA CUP RACK AND CABINET
James N. Breault, 2212 Ardmore Ave., Manhattan Beach, Calif. 90266
Filed Nov. 7, 1973, Ser. No. 413,425
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—129



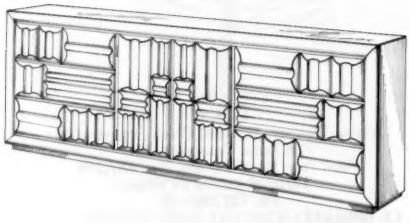
235,716
CHEST
Aaron Donner, Weston, Conn., assignor to The Lane Company, Inc.
Filed July 10, 1974, Ser. No. 487,376
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—154



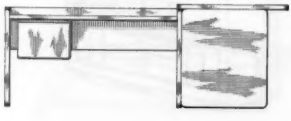
235,717
CHEST OF DRAWERS
Aaron Donner, Weston, Conn., assignor to The Lane Company, Inc.
Filed July 10, 1974, Ser. No. 487,379
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—154



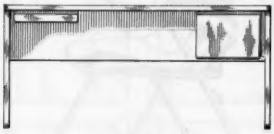
235,718
DRESSER
Aaron Donner, Weston, Conn., assignor to The Lane Company, Inc.
Filed July 10, 1974, Ser. No. 487,375
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—154



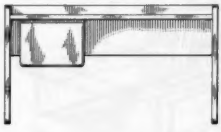
235,719
DESK OR SIMILAR ARTICLE
Douglas C. Ball, Senneville, Quebec, Canada, assignor to Massey-Ferguson Industries Limited, Toronto, Ontario, Canada
Filed Aug. 30, 1973, Ser. No. 393,238
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—162



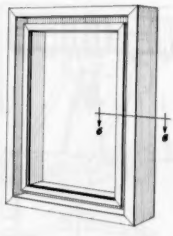
235,720
DESK OR SIMILAR ARTICLE
Douglas C. Ball, Senneville, Quebec, Canada, assignor to Massey-Ferguson Industries Limited, Toronto, Ontario, Canada
Filed Aug. 30, 1973, Ser. No. 393,243
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—162



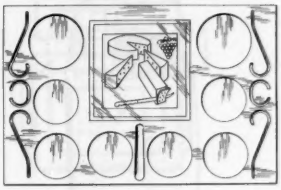
235,721
DESK OR SIMILAR ARTICLE
Douglas C. Ball, Senneville, Quebec, Canada, assignor to Massey-Ferguson Industries Limited, Toronto, Ontario, Canada
Filed Aug. 30, 1973, Ser. No. 393,250
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—162



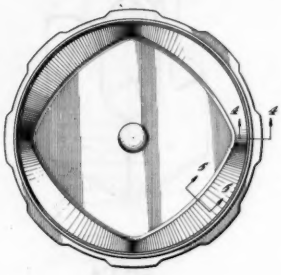
235,722
PICTURE FRAME
Richard Rettick, % Creative Impressions, 914 N. Harrison Ave., Campbell, Calif. 95008
Filed July 19, 1973, Ser. No. 380,894
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—242



235,723
SERVING TRAY OR SIMILAR ARTICLE
Kurt M. Vorchheimer, 92 Pinehurst Ave., New York, N.Y. 10033
Filed July 30, 1973, Ser. No. 383,886
Term of patent 3½ years
Int. Cl. D7—*99*
U.S. Cl. D7—70

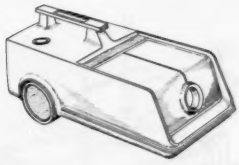


235,724
STORAGE CONTAINER OR THE LIKE
James B. Swett, Barrington, R.I., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Jan. 9, 1974, Ser. No. 432,023
Term of patent 14 years
Int. Cl. D7—*07*; D9—*02*
U.S. Cl. D7—79

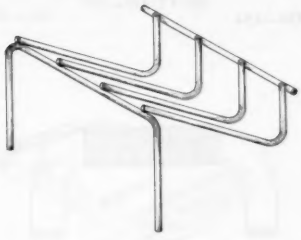


235,725
SALAD FORK OR THE LIKE
Harold P. Ashton, Providence, R.I., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed June 8, 1973, Ser. No. 368,413
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

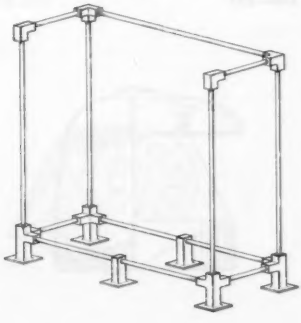
235,726
CANISTER VACUUM CLEANER OR SIMILAR ARTICLE
Clyde H. Williams, Coldwater, Mich., assignor to The Scott & Fetzer Company, Bronson, Mich.
Filed May 28, 1974, Ser. No. 473,754
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—168



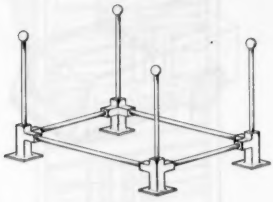
235,727
FIREPLACE GRATE
Joseph S. Parziale, 8922 Wilson Mills Road, Chesterland, Ohio 44026
Filed Aug. 30, 1974, Ser. No. 502,053
Term of patent 7 years
Int. Cl. D7—*08*
U.S. Cl. D7—207



235,728
FIREWOOD STORAGE RACK
Joseph S. Parziale, 8922 Wilson Mills Road, Chesterland, Ohio 44026
Filed Aug. 30, 1974, Ser. No. 502,055
Term of patent 7 years
Int. Cl. D7—*08*
U.S. Cl. D7—212

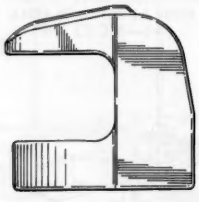


235,729
FIREWOOD STORAGE RACK
Joseph S. Parziale, 8922 Wilson Mills Road, Chesterland, Ohio 44026
Filed Aug. 30, 1974, Ser. No. 502,056
Term of patent 7 years
Int. Cl. D7—*08*
U.S. Cl. D7—212

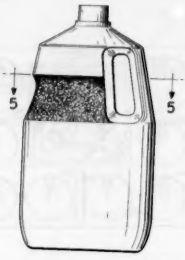


235,730
CARRYING CASE HANDLE
George W. Bush, Haddonfield, N.J., assignor to P.H.C. Industries, Inc., Camden, N.J.
Filed Jan. 8, 1973, Ser. No. 321,812
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—154

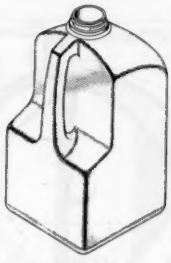
235,731
BEAM CLAMP
Blair A. Hubuda, Sr., 1890 Woodlawn Ave., Youngstown, Ohio 44514, and Anthony Kopatich, 742 Whipple Ave., Campbell, Ohio 44405
Filed Apr. 5, 1972, Ser. No. 241,492
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—235



235,732
JUG
James E. Plummer, 2530 Beaufort, Toledo, Ohio 43613
Filed Oct. 1, 1973, Ser. No. 402,282
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—39

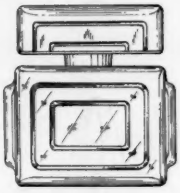


235,733
JUG OR THE LIKE
Richard L. Platte, Saline, Mich., assignor to Knudsen Corporation
Filed July 13, 1973, Ser. No. 378,925
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—40



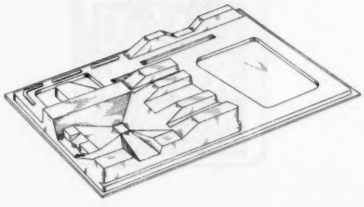
235,734
BOTTLE
Gordon A. Strand, Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed Apr. 2, 1973, Ser. No. 346,962
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—48

235,735
PERFUME BOTTLE
Pierre Francois Dinand, Levallois, France, assignor to Balenciaga S.A., Paris, France
Filed Dec. 26, 1973, Ser. No. 427,800
Claims priority, application France July 27, 1973
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—168

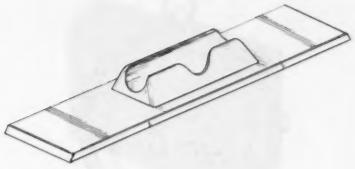


235,736
BOTTLE
Gordon A. Strand, Toledo, Ohio, and Richard L. Drow, Milwaukee, Wis., assignors to Owens-Illinois, Inc.
Filed July 30, 1973, Ser. No. 384,046
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—111

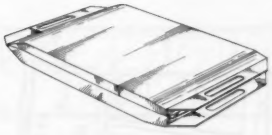
235,737
RIBBON CARTRIDGE SHIPPING TRAY
Anthony N. Paone, Syracuse, and William P. Montgomery and Aaron C. Zeamer, Cortland, N.Y., assignors to SCM Corporation, New York, N.Y.
Filed Dec. 6, 1973, Ser. No. 422,231
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—187



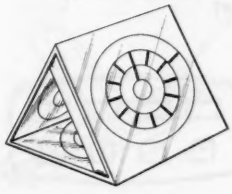
235,738
TRAY FOR PACKAGING TELESCOPIC GUN SIGHT OR THE LIKE
Danny F. Flaherty and Donald R. Payton, El Paso, Tex., assignors to W. R. Weaver Company, El Paso, Tex.
Filed May 22, 1973, Ser. No. 362,993
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—240



235,739
BAG
Justin D. Christensen, Overland Park, Kans. 66204
Filed Sept. 27, 1973, Ser. No. 401,397
Term of patent 14 years
Int. Cl. D9—*05*
U.S. Cl. D9—249

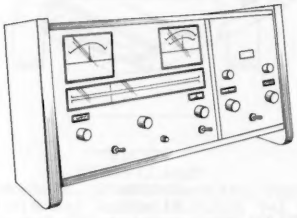


235,740
CLOCK
Dario D'Adda, Milan, Italy, assignor to Italora S.p.A.
Filed July 31, 1972, Ser. No. 276,377
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—14

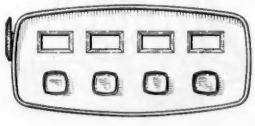


235,741
LOCKET WATCH
Benjamin Friedman, Tappan, N.Y., assignor to Solitron Devices, Inc., Tappan, N.Y.
Filed Apr. 24, 1973, Ser. No. 353,976
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—30

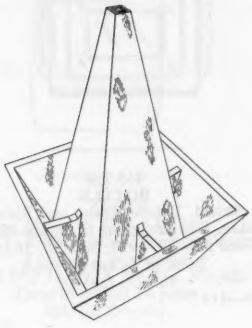
235,742
AUDIOMETER OR SIMILAR ARTICLE
Erwin H. Rock, Beden Ave., Ardsley, N.Y. 10502, and Irwin Klar, 5 Assembly Court, New City, N.N.Y. 10956
Filed Jan. 22, 1974, Ser. No. 435,532
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—46



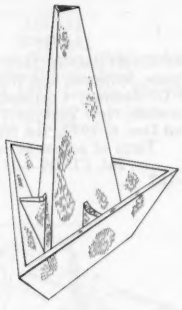
235,743
COUNTER
David Izenzon, 316 E. 3rd St., New York, N.Y. 10009
Filed July 30, 1973, Ser. No. 384,140
Term of patent 3½ years
Int. Cl. D10—*99*
U.S. Cl. D10—97



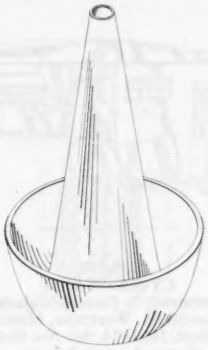
235,744
TRAFFIC HAZARD MARKER
Will Clarke England, 7310 Eastcrest, Austin, Tex. 78752
Filed Jan. 11, 1974, Ser. No. 432,471
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—109



235,745
TRAFFIC HAZARD MARKER
Will Clarke England, 7310 Eastcrest, Austin, Tex. 78752
Filed Jan. 11, 1974, Ser. No. 432,638
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—109



235,746
TRAFFIC HAZARD MARKER
Will Clarke England, 7310 Eastcrest, Austin, Tex. 78752
Filed Jan. 11, 1974, Ser. No. 432,637
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—109

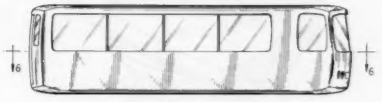


235,747
AUDIBLE ALARM
Louis P. Sweany, Carmel, Ind., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.
Filed Aug. 29, 1973, Ser. No. 392,623
Term of patent 14 years
Int. Cl. D29—*02*
U.S. Cl. D10—120

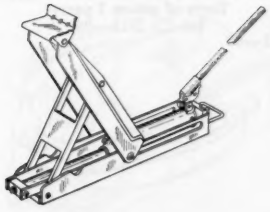
235,748
ILLUMINATED PEDESTRIAN SIGNAL FACE
Henry Dowding, Staten Island, N.Y., assignor to The Marbelite Company, Inc., Brooklyn, N.Y.
Filed Jan. 11, 1974, Ser. No. 432,755
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—121

235,749
ALARM CONTAINER
Joseph T. Sullivan, Huntingdon Valley, Pa., assignor to Standard-Farrington Alarm & Signal Corp., Trevose, Pa.
Filed Oct. 12, 1973, Ser. No. 405,779
Term of patent 14 years
Int. Cl. D29—*02*
U.S. Cl. D10—121

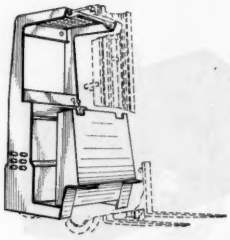
235,750
CAR FOR ELEVATED RAILWAY
Lawrence K. Edwards, 565 Arastradero Road, Palo Alto, Calif. 94306
Filed Oct. 2, 1973, Ser. No. 402,840
Term of patent 14 years
Int. Cl. D12—*03*
U.S. Cl. D12—40



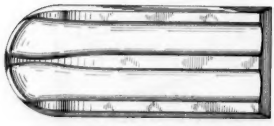
235,751
ROADSIDE SERVICE JACK
John R. Butorac, Hales Corners, Wis., assignor to Applied Power, Inc., Milwaukee, Wis.
Filed Oct. 24, 1973, Ser. No. 409,163
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—55



235,752
LIFT TRUCK BODY
Darrell C. Fuller and William A. Williamson, Niles, Mich., assignors to Clark Equipment Company
Filed Apr. 23, 1973, Ser. No. 353,862
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—61

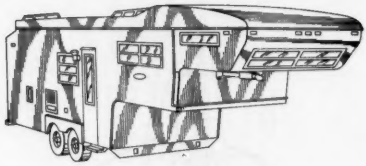


235,753
BOAT HULL
Harry Bremer, Box 488, Elkhart Lake, Wis. 53020
Filed Oct. 31, 1973, Ser. No. 411,478
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—62

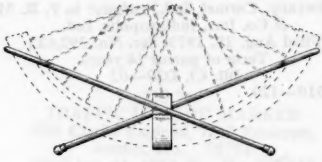


235,754
BOAT
Richard F. Berry, St. Louis County, Mo. (6 Zinzer Court, St. Louis, Mo. 63123)
Filed Feb. 28, 1974, Ser. No. 446,611
Term of patent 7 years
Int. Cl. D12—*06*
U.S. Cl. D12—63

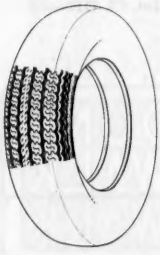
235,755
HOUSE TRAILER
John May, Rte. 2, Concordia, Mo. 64020
Filed Oct. 5, 1972, Ser. No. 295,222
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—103



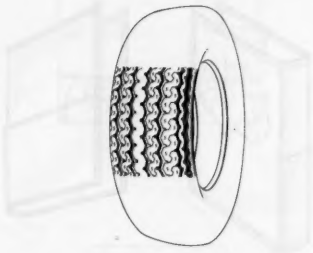
235,756
CYCLE STAND
Almon F. Townsend, % Persons-Majestic Mfg. Co., 72 Commercial St., Worcester, Mass. 01608
Filed Sept. 10, 1974, Ser. No. 504,805
Term of patent 7 years
Int. Cl. D8—*99*
U.S. Cl. D12—115



235,757
TIRE
Jean-Pierre Largeteau, Boulogne, France, assignor to Pneumatiques Caoutchouc Manufacture et Plastiques Kleber-Colombes
Filed Apr. 13, 1973, Ser. No. 350,999
Claims priority, application France Feb. 8, 1973
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—143

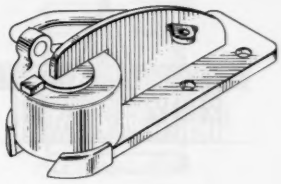


235,758
TIRE
Jean-Pierre Largeteau, Boulogne, France, assignor to Pneumatiques Caoutchouc Manufacture et Plastiques Kleber-Colombes
Filed Apr. 13, 1973, Ser. No. 350,998
Claims priority, application France Oct. 17, 1972
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—143

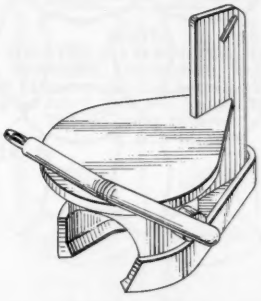


235,759
SKI CARRIER
Ronald W. Parsons, Tottenham, Ontario, Canada, assignor to A.L. & W. Limited
Filed Jan. 8, 1974, Ser. No. 431,613
Claims priority, application Canada July 30, 1973
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—157

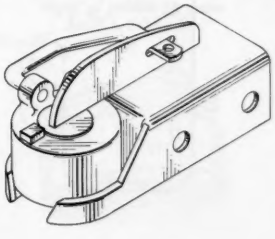
235,760
UNIVERSAL COUPLING TRAILER HITCH
Edward A. Genzel, 1226 Bardfield St., and Brian M. Bernhardt, 1317 Larry Drive, both of Garland, Tex. 75041
Filed Aug. 27, 1973, Ser. No. 391,989
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—162



235,761
UNIVERSAL COUPLING
Edward A. Genzel, 1226 Bardfield St., and Brian M. Bernhardt, 1317 Larry Drive, both of Garland, Tex. 75041
Filed Aug. 27, 1973, Ser. No. 391,988
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—162

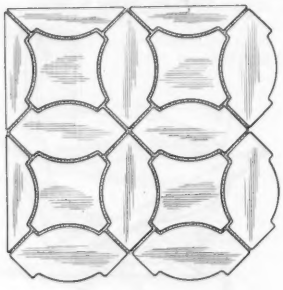


235,762
UNIVERSAL COUPLING TRAILER HITCH
Edward A. Genzel, 1226 Bardfield St., and Brian M. Bernhardt, 1317 Larry Drive, both of Garland, Tex. 75041
Filed Aug. 27, 1973, Ser. No. 391,990
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—162



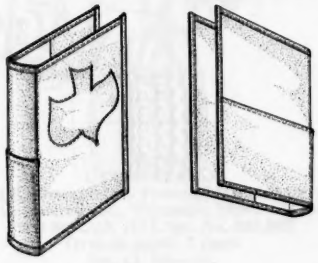
235,763
BUILDING
Wallace B. Roderick and Michael C. Gibson, both of 4th and Fulton, Garden City, Kans. 67846
Filed Sept. 17, 1973, Ser. No. 397,629
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 B

235,764
FLOOR COVERING OR SIMILAR ARTICLE
William L. Le Vahn, 4249 Twin Oak Lane, Minneapolis, Minn. 55422
Filed Dec. 21, 1972, Ser. No. 317,175
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D18—2 B



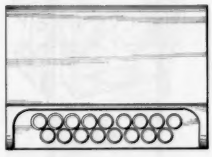
235,765
PERPETUAL CALENDAR OR SIMILAR ARTICLE
Dennis A. Knaus, Germantown, and Richard E. Wysocky, Grafton, Wis., assignors to Jos. Schlitz Brewing Company, Milwaukee, Wis.
Filed Sept. 4, 1973, Ser. No. 393,795
Term of patent 14 years
Int. Cl. D19—*03*
U.S. Cl. D19—25

235,766
BOOK COVER
Gregg L. Gray, Laguna Beach, Calif. (1117 W. Struck, Orange, Calif. 92667)
Filed Aug. 23, 1973, Ser. No. 390,744
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—26

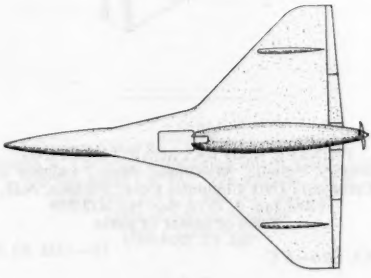


235,767
ALBUM COVER OR THE LIKE
Abraham Bernstein, Forest Hills, N.Y., assignor to Kleer-Vu Industries, Inc., New York, N.Y.
Filed June 29, 1973, Ser. No. 374,885
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—31

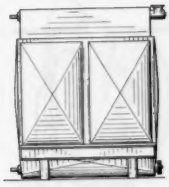
235,768
PUSH BUTTON TELEPHONE LIST FINDER
Chuzo Mori, Tokyo, Japan, assignor to Carl Manufacturing Company Ltd., Tokyo, Japan
Filed June 4, 1973, Ser. No. 366,532
Claims priority, application Japan Mar. 3, 1973
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—76

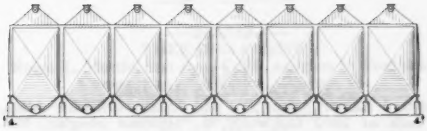


235,769
REMOTELY PILOTED VEHICLE DRIVEN BY A PUSHER PROPELLER
Le Roy I. Sather, 2532 14th W., Seattle, Wash. 98119
Filed Aug. 25, 1971, Ser. No. 175,028
Term of patent 7 years
Int. Cl. D22—*04*
U.S. Cl. D22—11

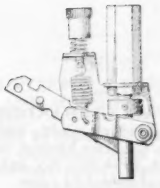


235,770
GRAIN ELEVATOR
Leo M. Becker, 1833 Swope Parkway, Kansas City, Mo. 64130
Filed Feb. 8, 1974, Ser. No. 440,787
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—2

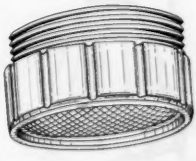




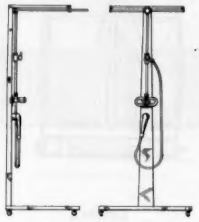
235,771
POULTRY WATERING VALVE
Reuben L. Christophel, Harrisonburg, Va., assignor to Shenandoah Manufacturing Co., Inc., Harrisonburg, Va.
Filed July 9, 1973, Ser. No. 377,284
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19



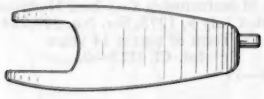
235,772
AERATOR
Dominic Anthony Saporito, Fanwood, N.J., assignor to American Standard Inc., New York, N.Y.
Filed Feb. 20, 1973, Ser. No. 334,161
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35



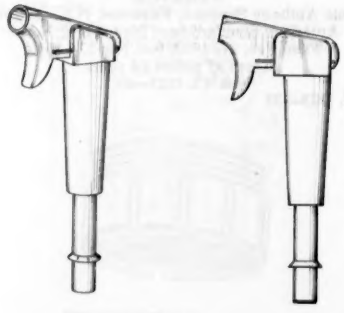
235,773
PORTABLE SHOWER
Arne Ohlson, Skimmelgatan 5, Malmo, Sweden
Filed Sept. 7, 1973, Ser. No. 394,978
Claims priority, application Sweden Mar. 8, 1973
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—57



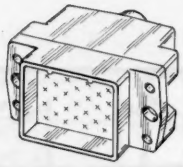
235,774
DENTAL FLOSS HOLDER
Edward Lamar Allen, Sr., and Lillian Christine Allen, both of 2002 Oakwood St., Hillcrest Heights, Md. 20031
Filed Aug. 28, 1973, Ser. No. 392,197
Term of patent 7 years
Int. Cl. D24—*99*
U.S. Cl. D24—1 D



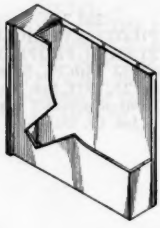
235,775
DENTAL VACUUM HANDPIECE
Donald R. Swatman, Modesto, Calif., assignor to Den-Tal-Ez Mfg. Co., Des Moines, Iowa
Filed Apr. 19, 1974, Ser. No. 462,352
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—1 R



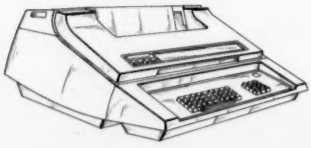
235,776
PLUG HOUSING
Jack L. Bowen, Larry G. Fischer, and James Ryan, Waseca, Minn., assignors to E. F. Johnson Company, Waseca, Minn.
Filed June 20, 1972, Ser. No. 264,424
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 B



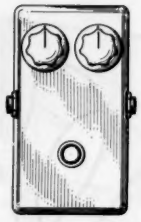
235,777
TANK FOR FAN FOLD TAPE
Gene D. Vedder, Granada Hills, Calif., assignor to Ex-Cell-O Corporation, Detroit, Mich.
Original design application Nov. 6, 1972, Ser. No. 304,236, now Patent No. 230,362. Divided and this application July 27, 1973, Ser. No. 383,333
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 R



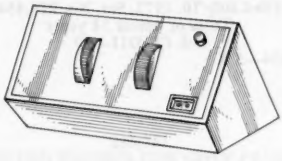
235,778
PRINTER AND KEYBOARD HOUSING
Gregory Fossella, Marshfield, Mass., assignor to Centronics Data Computer Corp., Hudson, N.H.
Filed Jan. 9, 1974, Ser. No. 432,059
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



235,779
PHASING SIMULATOR FOR A MUSICAL INSTRUMENT
Keith Barr, 25 Southland Drive, Rochester, N.Y. 14623
Filed Feb. 6, 1974, Ser. No. 440,149
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13 C



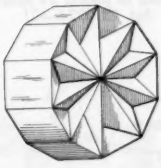
235,780
DICTATION TRANSCRIBE STATION
William Lansing Plumb, New York, N.Y., assignor to Dictaphone Corporation, Rye, N.Y.
Filed Dec. 26, 1972, Ser. No. 317,942
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 B



235,781
CIGARETTE HOLDER
Kenneth A. Carleton, Huntington Beach, Calif., assignor to Spaceship Up, Inc., Los Angeles, Calif.
Filed Oct. 5, 1973, Ser. No. 404,028
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—07

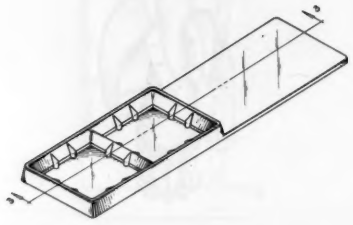
235,782
TREE ORNAMENT
Roger L. Martin, San Jose, Calif., assignor to Container Corporation of America, Chicago, Ill.
Filed Jan. 28, 1974, Ser. No. 436,873
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—1 B

235,783
TREE ORNAMENT
Roger L. Martin, San Jose, Calif., assignor to Container Corporation of America, Chicago, Ill.
Filed Feb. 25, 1974, Ser. No. 445,602
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—1 C

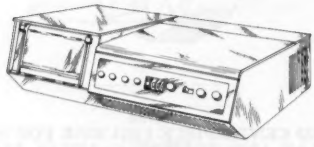


235,784
SLOTTED CENTERPIECE FIGURINE FOR NAPKIN DISPLAY AND HOLDING CANDLES, FLOWERS OR THE LIKE
Dorothy E. Maloy, 6250 E. Keim Drive, Scottsdale, Ariz. 85253
Filed Nov. 9, 1973, Ser. No. 414,399
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—23 E

235,785
MICROBIOLOGICAL NUTRIENT MEDIUM HOLDER
Kenneth Dale Collister, Elkhart, Ind., and Leighton Clifford Johnson, Edwardsburg, Mich., assignors to Miles Laboratories, Inc., Elkhart, Ind.
Filed July 5, 1974, Ser. No. 486,012
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D32—1 A



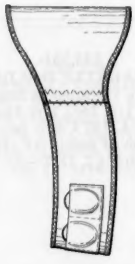
235,786
DENSITOMETER OR SIMILAR ARTICLE
Gianfranco D. Zaccai, Cambridge, Mass., assignor to Instrumentation Laboratory, Inc., Lexington, Mass.
Filed Sept. 25, 1973, Ser. No. 400,559
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D32—2 C



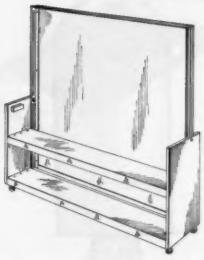
235,787
STUFFED TOY ANIMAL FIGURE
Barbara H. Gorman, Mansfield, Conn. (Willington Oaks, Apt. 101, Daleville Road, Storrs, Conn. 06268)
Filed Nov. 5, 1973, Ser. No. 412,552
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—2 R

235,788
FACIAL EXERCISER
Agnes J. Eberhardt, 6636 Neosho St., St. Louis, Mo. 63109
Filed July 10, 1972, Ser. No. 270,453
Term of patent 14 years
Int. Cl. D21—*99*
U.S. Cl. D34—5 K

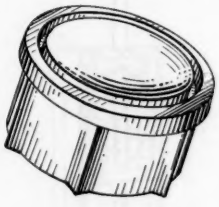
235,789
WEIGHTED FACIAL EXERCISER
Agnes J. Eberhardt, 6636 Neosho St., St. Louis, Mo. 63109
Filed July 10, 1972, Ser. No. 270,454
Term of patent 14 years
Int. Cl. D21—*99*
U.S. Cl. D34—5 K



235,790
CONVERTIBLE TABLE TENNIS TABLE AND SHELF UNIT
Melvin Zimmers, Westport, and Gary A. Gerber, Weston, Conn., assignors to Caleco Industries, Inc., Hartford, Conn.
Filed Mar. 16, 1973, Ser. No. 341,885
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 J

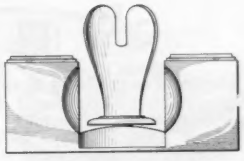


235,791
WEIGHTED INSERTS FOR GOLF CLUBS OR SIMILAR ARTICLES
Ronald A. Kurtz, Englewood, and Henry H. Utzinger, Ridgefield, N.J., assignors to Kulite Tungsten Corporation, Ridgefield, N.J.
Filed Feb. 26, 1973, Ser. No. 335,698
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GC

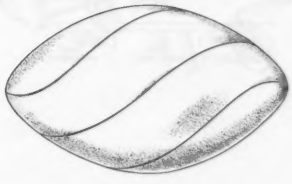


235,792
SERPENTINE PLAYGROUND CLIMBER
Robert S. Wormser, Ocala, Fla., assignor to Game Time, Inc., Litchfield, Mich.
Original design application Feb. 12, 1973, Ser. No. 331,802. Divided and this application Oct. 16, 1974, Ser. No. 515,177
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 H

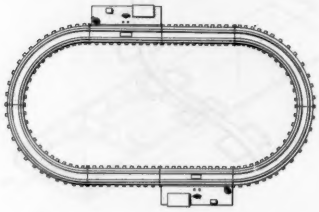
235,793
TOY BEAUTY STATION
Rouben T. Terzian and Marvin I. Glass, Chicago, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Jan. 29, 1973, Ser. No. 327,416
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AC



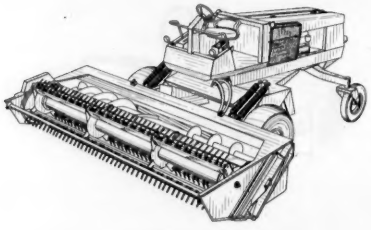
235,794
FOOTBALL WITH SPIRAL SEAMS
Frank G. Kroener, 1755 E. Ocean Blvd., Newport Beach, Calif. 92661
Filed June 4, 1973, Ser. No. 366,601
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 EE

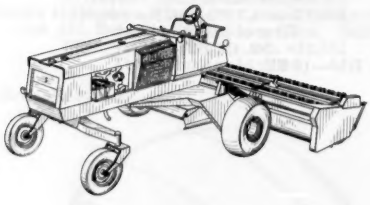


235,795
TOY TRAIN TRACK
Teruo Matsumoto, Tokyo, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan
Filed May 9, 1973, Ser. No. 358,643
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 MM

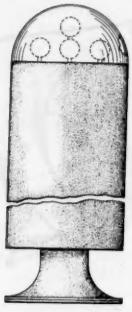


235,796
SELF-PROPELLED WINDROWER
Cecil L. Case, Ferol S. Fell, and William F. Potter, Newton, and Richard Jack Robbins, Derby, Kans., assignors to Hesston Corporation, Hesston, Kans.
Filed July 18, 1973, Ser. No. 380,190
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1 E



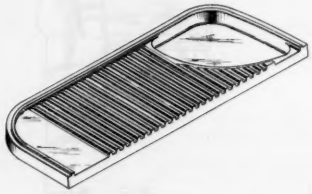


235,797
BOLLARD LIGHT FIXTURE
Marvin Paul Friedberg, New York, N.Y., assignor to Bajer Industries Incorporated, Fairfield, N.J.
Filed June 6, 1974, Ser. No. 476,879
Term of patent 14 years
Int. Cl. D26—*03*; D10—*06*
U.S. Cl. D48—31

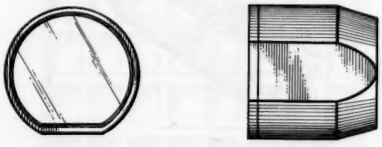


235,798
EXTERIOR LAMP
Francis L. Struben, 3870 Jarrettsville Pike, Jarrettsville, Md. 21084
Filed Aug. 5, 1974, Ser. No. 494,864
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31

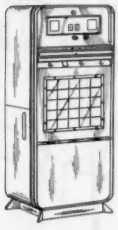
235,799
CLOTHES SCRUBBING DEVICE FOR ATTACHMENT TO A WASHING MACHINE LID
Harrison K. Linger, Louisville, Ky., assignor to General Electric Company
Filed Mar. 1, 1974, Ser. No. 447,132
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D49—1 C



235,800
OCULAR ASSEMBLY FOR A RIFLESCOPE
Gerrit A. Van Exel, Fullerton, Calif., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Apr. 25, 1973, Ser. No. 354,212
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 E

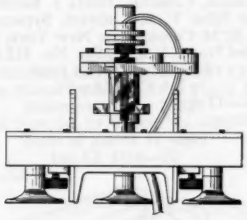


235,801
NEWSPAPER VENDING MACHINE
Fred M. Gore, 2808 Oak Lawn, Dallas, Tex. 75215
Filed June 21, 1973, Ser. No. 372,005
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D52—3 R

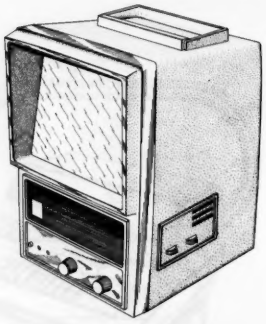


235,802
CASH REGISTER OR SIMILAR ARTICLE
Elmer J. Stoltz, Castro Valley, and Richard A. Nyquist, Menlo Park, Calif., assignors to The Singer Company, New York, N.Y.
Filed Dec. 26, 1973, Ser. No. 427,868
Term of patent 14 years
Int. Cl. D20—*99*
U.S. Cl. D52—4 A

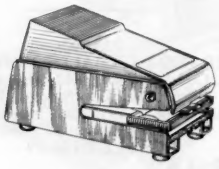
235,803
BRANDER FOR BASEBALL BAT OR THE LIKE
Herbert W. Gourley, Springfield, Mo., assignor to Blue Darter, Inc., Lees Summit, Mo.
Filed Sept. 1, 1972, Ser. No. 285,836
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D55—1 R



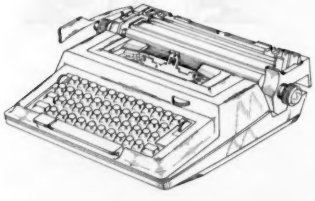
235,804
MOTION PICTURE PROJECTOR-VIEWER
Alex J. Procop, 20731 Prairie St., Chatsworth, Calif. 91311
Filed Aug. 22, 1973, Ser. No. 390,391
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D61—1 N



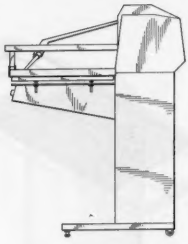
235,805
STATIONERY EMBOSSER
Daniel E. McCue, Santa Barbara, Calif., assignor to M & R Seal Press Co., Inc., Roselle, N.J.
Filed Sept. 14, 1973, Ser. No. 397,773
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D64—10



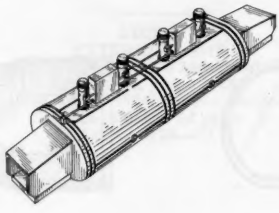
235,806
TYPEWRITER
Chester J. Abend, Camillus, James J. Bienkowski, Cazenovia, and Ellen V. B. Ludwick, Syracuse, N.Y., assignors to SCM Corporation, New York, N.Y.
Filed Nov. 14, 1973, Ser. No. 415,883
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 A



235,807
PRINTING PRESS
John R. Krutsch, Glenview, Ill., assignor to American Screen Printing Equipment Company, Chicago, Ill.
Filed Nov. 19, 1973, Ser. No. 416,924
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D64—11 R



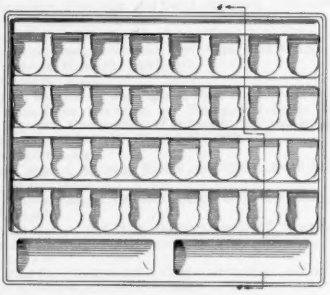
235,808
CRYOGENIC FREEZER OR SIMILAR ARTICLE
Lyle L. Cann, Peotone, Ill., assignor to Chemetron Corporation, Chicago, Ill.
Filed Feb. 9, 1973, Ser. No. 331,122
Term of patent 14 years
Int. Cl. D15—*07*
U.S. Cl. D67—2 R

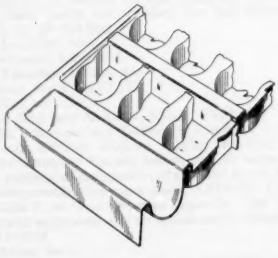


235,809
WALKER
Morton I. Thomas, Bakertown Road, Monroe, N.Y. 10950
Filed Apr. 9, 1973, Ser. No. 349,053
Term of patent 14 years
Int. Cl. D3—*03*
U.S. Cl. D88—1

235,810
WALKER
Morton I. Thomas, Bakertown Road, Monroe, N.Y. 10950
Filed May 25, 1973, Ser. No. 364,067
Term of patent 14 years
Int. Cl. D3—*03*
U.S. Cl. D88—1

235,811
MEDICINE TRAY
Phillip E. Parsons, Columbus, Ohio, assignor to The Lynn Drug Company, Columbus, Ohio
Filed Oct. 19, 1973, Ser. No. 407,796
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1 U

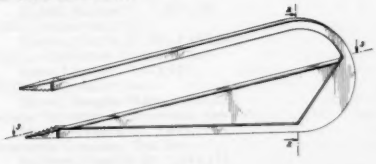




235,812
BABY BOTTLE
Arthur C. Barr, 111 King St., Madison, Wis. 53703
Filed Apr. 2, 1973, Ser. No. 347,198
Term of patent 14 years
Int. Cl. D9—*01*; D28—*01*
U.S. Cl. D83—8 A

235,813
FEMININE DOUCHE SYRINGE
Richard C. Roth, Milltown, N.J., assignor to Block Drug Company Inc., Jersey City, N.J.
Filed Sept. 13, 1973, Ser. No. 397,011
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1 Q

235,814
SURGICAL SUTURE REMOVER
William Glenn Allen, Jr., 1811 Floyd Ave., Richmond, Va. 23220
Filed Nov. 30, 1973, Ser. No. 420,555
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—12 R



235,815

PERMANENT WAVE HEATING MACHINE

John R. Forsberg, Arlington Heights, Ill., and Edward H. Meisner, Wyckoff, N.J., assignors to Helene Curtis Industries, Inc.

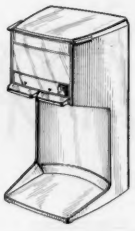
Filed July 25, 1973, Ser. No. 382,360
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 E

235,816

HOT BEVERAGE DISPENSER

Richard B. Hall, Canton, Ohio, assignor to Sunbeam Corporation, Chicago, Ill.

Filed June 22, 1973, Ser. No. 372,890
Term of patent 14 years
Int. Cl. D7—*04*; D15—*08*
U.S. Cl. D94—3 B



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF JULY, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. J. Gerrard and Company: *See*—
Simich, Emil, 3,893,316.

A. O. Smith-Inland, Inc.: *See*—
Jackman, Robert M.; and McDonald, William N., 3,893,263.

A. Schild S.A.: *See*—
Fluck, Josef; and Zaugg, Roland, 3,893,290.

Abbott Laboratories: *See*—
Chu, Daniel Tim-Wo; and Garmaise, David Lyon, 3,894,061.

Abe, Iwao: *See*—
Sakakibara, Kouzou; Abe, Iwao; and Matsuoka, Kazuyuki, 3,894,091.

Abex Corporation: *See*—
Frank, Earl E., 3,893,643.

Abu-el-Haj, Marwan J.; and McFarland, James W., to Pfizer Inc. Certain 3-oxo-2(halophenyl)-4,5,6,7-tetrahydro-v-triazolo[1,5a]-pyridines. 3,894,036, Cl. 260-295.00K.

Acda, Petrus Marinus, to Polva Nederland B.V. Apparatus for forming a socket in thermoplastic pipe. 3,893,794, Cl. 425-393.000.

ACF Industries, Incorporated: *See*—
Natho, Paul J., 3,893,652.

Ackerman, Timothy. Rotary valve train. 3,893,483, Cl. 137-625.210.

Acres, Alan Birt, to Electrothermal Engineering Limited. Measuring devices. 3,893,341, Cl. 73-362.0AR.

Addressograph Multigraph Corporation: *See*—
Borke, Thomas J.; and MacDonald, Donald W., 3,893,391.
See, Gary G., 3,893,393.

Aerpat A.G.: *See*—
Skinner, Edward Albert, 3,893,211.

Aga, Yutaka. Centrifugal pump. 3,893,781, Cl. 415-53.000.

Agarwala, Bhaskar Kumar, to Everest & Jennings, Inc. Fluid circulating heating pad. 3,894,213, Cl. 219-297.000.

Agency of Industrial Science & Technology: *See*—
Sunahara, Hiroshi; Ishihara, Yutaka; and Nakayama, Noboru, 3,893,333.

Agfa-Gevaert AG: *See*—
Bestenreiner, Friedrich; and Deml, Reinhold, 3,893,856.

Agfa-Gevaert Aktiengesellschaft: *See*—
Herzhoff, Peter; Gref, Hans; Maus, Fritz; Schweicher, Wolfgang; Frenken, Hans; Browatzki, Kurt; Voss, Karl; Wasser, Willi; and Bubmann, Heinrich, 3,893,410.

Agnew, Marc N.: *See*—
Effland, Richard C.; and Agnew, Marc N., 3,894,058.

Agouri, Elias; Catte, Raymond; and Dauba, Jean-Louis, to Aquitaine Total Organico. Composition of polyolefin, polystyrene and block of said polymers. 3,894,117, Cl. 260-876.00B.

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Akai, Shin-Ichi; Hayashi, Makoto; Iguchi, Shin-Ichi; and Shimoda, Takashi, to Sumitomo Electric Industries, Ltd. Method and apparatus of the continuous preparation of epitaxial layers of semiconducting III-V compounds from vapor phase. 3,893,876, Cl. 148-175.000.

Akeson, Walter R., to Great Western Sugar Co., The. Method of protecting stored sugarbeets and an article useful therefor. 3,894,161, Cl. 426-419.000.

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Anderson, John P., to United States of America, Navy. Technique for fabricating vacuum waveguide in the x-ray region. 3,893,231, Cl. 29-600.000.

Anderson, Perry W.: *See—*
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Asai, Koetsu; Imanishi, Nobuyuki; and Yamada, Terutoshi, to Kobe Steel, Ltd.; and Mitsubishi Jukogyo Kabushiki Kaisha. Method for demolishing a consolidated and hardened iron ore powder body contained in a hold of an iron ore carrier. 3,893,577, Cl. 214-152.000.

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Asaoka, Takashi, to Nippon Telegraph and Telephone Public Corporation. Dynamic shift register utilizing minority carrier storage effect of semiconductor device. 3,894,248, Cl. 307-211.00R.

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Aubert, Michel; Bellier, Michel; and Berniolles, Jean-Marie, to Commissariat a l'Energie Atomique. Removable diagrid for supporting the fuel assemblies of a nuclear reactor. 3,893,886, Cl. 176-87.000.

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Awad, John A. Membrane fluid diffusion exchange device. 3,893,926, Cl. 210-321.000.

Axelsson, Evald Gustav; and Collier, David, to Caterpillar Tractor Co. Systems for operating and controlling hydraulically driven winches, hoists, windlasses and the like. 3,893,572, Cl. 212-49.000.

Azar, Jack C.; and O'Neill, Marianne C., to Xerox Corporation. Pressure fixable toner. 3,893,932, Cl. 252-62.100.

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Barkay, Joseph; Zuckerman, Henryk; and Pundak, Nachman, to Ricor, Ltd. Freezing apparatus particularly useful for freezing spermatozoa. 3,893,308, Cl. 62-223.000.

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Bassing, Friedrich Wilhelm; and Hoffmann, Gottfried Gerhard Wilhelm, to ALFA-LAVAL Bergedorfer Eisenwerke GmbH. Apparatus for regulating the tension of warp threads in power looms. 3,893,489, Cl. 139-110.000.

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Bergmann, Wilfried Hellmuth. Method of abrasive machining of material by means of an energy beam. 3,894,208, Cl. 219-121.0EM.

Beriger, Ernst, to Ciba-Geigy AG. Phosphonic acid dithiol esters. 3,894,125, Cl. 260-940.000.

Berkelius, Hans. Drive motor for cleaning glass surfaces. 3,893,203, Cl. 15-250.220.

Bernard, James A., to General Motors Corporation. Retainer for refrigerator shelf. 3,893,739, Cl. 312-138.00A.

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Besson, Andre, to Thomson-CSF. Method of producing vacuum-tight seals between ceramic and alluminum components, evacuated envelopes incorporating the components sealed by said method, and vacuum tubes incorporating said envelopes. 3,893,224, Cl. 228-124.000.

Bestenreiner, Friedrich; and Deml, Reinhold, to Agfa-Gevaert AG. Method of producing geometric optical rasters. 3,893,856, Cl. 96-38.300.

Beucher, Robert A. Lifting mechanism. 3,893,540, Cl. 182-2.000.

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Birnbaum, Michael R., to Medtronic, Inc. Blood pressure monitoring system. 3,893,452, Cl. 128-2.05A.

Bishop, John Daniel; and Kerenyi, Ladislas George, Jr., to Western Electric Company Bell Telephone Laboratories Incorporated. Frequency limited ferroresonant power converter. 3,894,280, Cl. 321-18.000.

Bittner, John R., to General Electric Company. Method of making wire matrix print head nozzle. 3,893,220, Cl. 29-433.000.

Black, James Whyte; and Parsons, Michael Edward, to Smith Kline & French Laboratories Ltd. Pharmaceutical compositions and methods of inhibiting H-1 and H-2 histamine receptors. 3,894,151, Cl. 424-246.000.

Blaimschein, Gottfried, to GFM Gesellschaft fur Fertigungstechnik und Maschinenbau Aktiengesellschaft. Swaging tool. 3,893,328, Cl. 72-404.000.

Blair, E. Allan, to Medic-Ease Corporation. Mattress for preventing bedsores. 3,893,198, Cl. 5-345.00R.

Blanchard, Kenneth E.; Hook, Kenneth R.; and Midili, Arthur R., to Wells Electronics, Inc. Carrier for microcircuit packages. 3,893,742, Cl. 339-119.00R.

Blinow, Igor, to Polaroid Corporation. Flat torque rate drive system. 3,894,294, Cl. 354-158.000.

Blitz, Carmont; Agrawal, Hari N.; and Oliver, Leon S., to Blitz Corporation, The. Loading and unloading system for bus. 3,893,697, Cl. 303-6.100.

Blitz Corporation, The: *See—*
Blitz, Carmont; Agrawal, Hari N.; and Oliver, Leon S., 3,893,697.

Block Engineering, Inc.: *See—*
Webb, Robert H., 3,894,259.

Blohm, Thomas R.: *See—*
MacKenzie, Robert D.; Blohm, Thomas R.; and Roberts, Edward M., 3,894,002.

Bloomfield, Alan M., to Sears, Roebuck and Co. Battery and generator vehicle lighting system. 3,894,281, Cl. 322-1.000.

Bluntz, Sylvain: *See—*
Jamois, Gerard; and Bluntz, Sylvain, 3,893,609.

Bobo, Roy A. Cyclone centrifuge apparatus. 3,893,914, Cl. 209-144.000.

Bobo, Roy A. Cylindrical cyclone centrifuges. 3,893,922, Cl. 209-211.000.

Bochmann, Carl E.; and Germuska, Richard W., to H. D. Hudson Manufacturing Company. Swivel outlet for sprayer or the like. 3,893,630, Cl. 239-587.000.

Bock, Manfred, to Heyl & Co. Chemisch-Pharmazeutische Fabrik, Firma. Production of penicillamine-mercuric-mercaptide and of penicillamine and acid addition salts of penicillamine. 3,894,067, Cl. 260-431.000.

Boehmke, Gunther, to Bayer Aktiengesellschaft. W-Aminoalkanesulphonic acid derivatives. 3,894,064, Cl. 260-401.000.

Boeing Company, The: *See—*
Kelley, George S., 3,893,638.
Mahaffey, Derek W.; and Drummond, James E., 3,893,845.

Bolenbaugh, Daniel L., to Bendix Corporation, The. Application adjuster for drum brake. 3,893,548, Cl. 188-79.5GC.

Bone, Arnold R., to Dennison Manufacturing Company. Fastener attaching device. 3,893,612, Cl. 227-67.000.

Borg-Warner Corporation: *See—*
Mickus, Frank, 3,893,818.

Borke, Thomas J.; and MacDonald, Donald W., to Addressograph Multigraph Corporation. Control circuit for master quantities in printing systems. 3,893,391, Cl. 101-141.000.

Boser, Ronald J., to B & W Manufacturing Co., Inc. Sewing apparatus. 3,893,402, Cl. 112-105.000.

Bosse, Frank; Tetenborg, Konrad; and Mundus, Friedhelm, to Windmoller & Holscher. Process and apparatus for manufacturing pads of bags made of synthetic thermoplastics. 3,893,382, Cl. 93-93.0HT.

Bostrom, Sigward Gunnar, to ARENCO-JM AB. Method of packaging load units in weldable plastic foil. 3,893,279, Cl. 53-27.000.

Bottles, David M., to Compucorp. Illumination and sensor arrangement for card reader. 3,894,216, Cl. 235-61.11E.

Boule, Esdras. Electromagnetic door lock. 3,893,723, Cl. 292-140.000.

Bowmar Instrument Corporation: *See—*
Sholtz, Mitchell D., 3,894,256.

Boyd, Kenneth M., to Rank Xerox, Ltd. Sheet feeding device. 3,893,662, Cl. 271-10.000.

Bradford, Robert M.: *See—*
Walker, Milo C.; and Bradford, Robert M., 3,893,527.

Brancaccio, Aldo; Ghetti, Giuseppe; and Bruzzone, Mario, to Snamprogetti S.p.A. Process for obtaining modified diene polymers. 3,893,983, Cl. 260-78.40D.

Brandhorst, Henry W., Jr.: *See—*
Evans, John C., Jr.; and Brandhorst, Henry W., Jr., 3,894,289.

Brandt, Dieter, to August Merckens Nachfolger Kommanditgesellschaft. Thixotropic coating agents based on urea adduct of polyamine and diisocyanates. 3,893,956, Cl. 260-18.0TN.

Branson Instruments, Incorporated: *See—*
Mims, Bruce L., 3,893,223.

Brantigan, John W. Catheter device for use in detecting gas in body fluids and tissue. 3,893,448, Cl. 128-2.00G.

Braun Aktiengesellschaft: *See—*
Cobarg, Claus Christian; and Kliegel, Walter, 3,893,755.

Braun, Martin, to Raytheon Company. Monochromatic x-ray generator. 3,894,239, Cl. 250-493.000.

Braun, Robert A.; and Mermelstein, Robert, to Xerox Corporation. Solid developer for electrostatic latent images. 3,893,934, Cl. 252-62.100.

Braunwieser, Johann, to GFM Gesellschaft fur Fertigungstechnik und Maschinenbau Aktiengesellschaft. Swaging machine. 3,893,321, Cl. 72-76.000.

Breece, George E. Condensate drainer. 3,893,473, Cl. 137-171.000.

Brenn, Reinhart; O'Neill, Thomas F.; and Shenoha, James, to Bron Electronics, Inc. Article feeding apparatus for engraving press or the like. 3,893,392, Cl. 101-150.000.

Brenneisen, Paul; Wenger, Thomas; Gallay, Jean-Jacques; and Schmid, Wolfgang, to Ciba-Geigy Corporation. Certain isothiocyanobenzimidazoles. 3,894,037, Cl. 260-309.200.

Brenner, Adolf, to SKF Industrial Trading and Development Company, B.V. Resilient sealing means for self-adjusting bearings. 3,893,735, Cl. 308-36.100.

Bresnick, Herbert L., to Xerox Corporation. Background reduction technique. 3,893,419, Cl. 118-637.000.

Bretford Manufacturing, Inc.: *See—*
England, William G., 3,893,740.

Brewer, John C., to Garbalizer Corporation of America. Shredder structure. 3,893,635, Cl. 241-243.000.

Brickner, Kenneth G., to United States Steel Corporation. Oxidation-resistant ferritic stainless steel. 3,893,849, Cl. 75-124.000.

Briskey, Robert J., to Zenith Radio Corporation. Binaural hearing aid system. 3,894,196, Cl. 179-107.0FD.

British Oxygen Company Limited, The: *See—*
Kusay, Roland Gregor Paul, 3,894,171.

British Petroleum Company Limited, The: *See—*
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British Secretary of State for Defence: *See—*
Jones, John Ivor Parry, 3,893,337.

Britt Tech Corporation: *See—*
Hockmuth, Gerald L.; and Norstrud, Iven R., 3,893,591.

Brockett, Bruce W.; and Miller Robert E., to NCR Corporation. Paper coating pigment material. 3,894,168, Cl. 428-514.000.

Brodie, Shepard B.: *See—*
United States of America, National Aeronautics and Space Administration; Greeb, Fredrick J.; Brodie, Shepard B.; and Flatau, Carl R., 3,893,573.

Bron Electronics, Inc.: *See—*
Brenn, Reinhart; O'Neill, Thomas F.; and Shenoha, James, 3,893,392.

Brooking, Ivor Harold: *See—*
Keenan, John Gregory; Chilman, John Alfred; and Brooking, Ivor Harold, 3,893,783.

Brother Kogyo Kabushiki Kaisha: *See—*
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Browatzki, Kurt: *See—*
Herzhoff, Peter; Gref, Hans; Maus, Fritz; Schweicher, Wolfgang; Frenken, Hans; Browatzki, Kurt; Voss, Karl; Wasser, Willi; and Bubmann, Heinrich, 3,893,410.

Brown, Barry M.; and Slowig, Walter D., to Eastman Kodak Company. Integral reverse osmosis membrane with highly pressed woven fabric support member. 3,894,166, Cl. 427-316.000.

Brown Boveri Sulzer-Turbomachinery Ltd.: *See—*
Zerlauth, Ferdinand, 3,893,784.

Brown, David James, to Conder International Limited. Beam and building incorporating the same. 3,893,276, Cl. 52-483.000.

Brown, Lorin B. C clamp structure. 3,893,661, Cl. 269-97.000.

Brown, Robert Warren, to Xerox Corporation. Process for producing encapsulated toner composition. 3,893,933, Cl. 252-62.100.

Broyde, Barret, to Western Electric Company, Incorporated. Additives to negative photoresists which increase the sensitivity thereof. 3,894,163, Cl. 427-43.000.

Brummer, Richard F.: *See—*
Brummer, William J.; and Brummer, Richard F., 3,893,501.

Brummer, William J.; and Brummer, Richard F. Vehicle wheel skid chains. 3,893,501, Cl. 152-213.00R.

Bruner, A. J. Crosstie for railroad track. 3,893,619, Cl. 238-83.000.

Brunswick Corporation: *See—*
Baker, Joseph Winston, 3,893,469.
Hager, James R.; and Riordan, Hugh E., 3,894,250.

Bruun, Eugene E.; and Simmons, Ray A., to United Aircraft Corporation. Catalytic monopropellant reactor with thermal feedback. 3,893,294, Cl. 60-39.46M.

Bruzzone, Mario: *See—*
Brancaccio, Aldo; Ghetti, Giuseppe; and Bruzzone, Mario, 3,893,983.

Bryant, Herman G., Jr.: *See—*
Norman, Vello; and Bryant, Herman G., Jr., 3,893,464.

Bryers, Richard W., to Foster Wheeler Corporation. Heat exchanger utilizing adjoining fluidized beds. 3,893,426, Cl. 122-4.00D.

Bubmann, Heinrich: *See—*
Herzhoff, Peter; Gref, Hans; Maus, Fritz; Schweicher, Wolfgang; Frenken, Hans; Browatzki, Kurt; Voss, Karl; Wasser, Willi; and Bubmann, Heinrich, 3,893,410.

Buchan, William R.; and Moore, Robert A., to Itek Corporation. Electrophotographic toner transfer and fusing apparatus. 3,893,761, Cl. 355-3.00R.

Buchert, Hermann: *See—*
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Buffalo Forge Company: *See—*
Schroeter, Joachim W., 3,893,779.

Bugaut, Andree: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 3,893,802.

Burckhardt, Manfred H.; Florus, Hans-Jorg; and Grossner, Horst, to Daimler-Benz Aktiengesellschaft. Installation for preventing spinning of the driven wheels of a motor vehicle. 3,893,535, Cl. 180-82.00R.

Burgin, Kermit H. Twin keel jet boat. 3,893,406, Cl. 115-16.000.

Burklund, Vernon D.; Schmidt, Joseph A.; and Jacobson, Michael D., to United States of America, Navy. Mechanically initiated igniter. 3,893,367, Cl. 89-27.00R.

Burley, Harvey A., to General Motors Corporation. Combination spark plug and precombustion chamber for rotary engine. 3,893,430, Cl. 123-8.130.

Burlington Industries, Inc.: *See—*
Finch, Wilton C.; and Eller, David C., 3,893,806.

Burness, Donald M.; Ling, Hans G.; and Ericson, Ronald H., to Eastman Kodak Company. 4-Aryl-1-carbamoyl-2-tetrazoline-5-thione stabilizer precursor in a heat stabilizable photographic element. 3,893,859, Cl. 96-61.00R.

Burnett, Richard T., to Bendix Corporation, The. Mechanical actuator for disc brake. 3,893,545, Cl. 188-72.600.

Burnett, Richard T.: *See—*
Kestermeier, William J.; and Burnett, Richard T., 3,893,546.

Burns-Biotec Laboratories, Inc.: *See—*
King, Dale A., 3,893,280.

Burroughs Corporation: *See—*
Carbine, Joseph C.; and Wojtowicz, Edward A., 3,893,594.

Buschhoff, Max; and Mueller, Karl Heinz, to Schering Aktiengesellschaft. Method for making higher alkyl tin thichlorides. 3,894,066, Cl. 260-429.700.

Bush, E. Crosby, to Associated Spring Corporation. Piston ring expander spring. 3,893,660, Cl. 267-1.500.

Butenko, Leonid Andreevich: *See—*
Fedorov, Nikolai Alexandrovich; Butenko, Leonid Andreevich; and Kazak, Vadim Vladimirovich, 3,893,327.

Butler, Russell Howard: *See—*
Prevorsek, Dusan Ciril; Kwon, Young Doo; Butler, Russell Howard; and Sharma, Raj Kumar, 3,893,331.

Butter, Stephen A.; Jurewicz, Anthony T.; and Kaeding, Warren W., to Mobil Oil Corporation. Conversion of alcohols, mercaptans, sulfides, halides and/or amines. 3,894,107, Cl. 260-668.00R.

Butterwick, Gilbert Nason, to RCA Corporation. Proximity image tube with bellows focussing structure. 3,894,258, Cl. 313-102.000.

Buttram, James R.; Woodward, Melvin H.; Hubbard, Charles E.; and Thronson, Howard K., to Upjohn Company, The. Gathering and windrowing machine. 3,893,286, Cl. 56-328.00R.

Buzby, George C., Jr., to American Home Products Corporation. 2,5,-6,7-Tetrahydro-3H-imidazo(1,2-D)(1,4)benzodiazepine-5,6-dicarboxylic acid esters. 3,894,040, Cl. 260-309.600.

Byers, James Otto, Jr., to Tomco, Inc. Pressure compensating fluid control valve. 3,893,471, Cl. 137-106.000.

C. L. Frost & Son, Inc.: *See—*
Esch, Richard E., 3,893,526.

Cabot Corporation: *See—*
Young, Richard W.; and Siebert, Sidney A., 3,894,211.

Cadiou, Jean G., to Societe Anonyme Automobiles Citroen. Control device for vehicle doors and other members. 3,893,260, Cl. 49-362.000.

Cain, Lester L.: *See—*
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Cain, Ned M.: *See—*
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California Computer Products, Inc.: *See—*
Trousdale, Robert B., 3,893,616.

Calmac Manufacturing Corporation: *See—*
MacCracken, Calvin D.; and Schmidt, Helmut J., 3,893,507.

Camilleri, Thomas M. Master pattern for producing cast raised figures. 3,893,822, Cl. 29-183.000.

Campanale, Anthony O.: *See—*
Armbruster, Melvin L.; Campanale, Anthony O.; and Schultz, Robert L., 3,893,282.

Campanella, Samuel J.; Suyderhoud, G.; Onufry, Michael, Jr.; and Kauffman, Eric R., to Communications Satellite Corporation. Adaptive echo canceller with digital center clipping. 3,894,200, Cl. 179-170.200.

Campbell, Bonnie J.; and Rieger, Klaus K., to Universal Oil Products Company. Method for providing improved nucleate boiling surfaces. 3,893,322, Cl. 72-98.000.

Campbell, Ralph L., to Standard Oil Company. Method and paper test strip for determining low levels of lead in hydrocarbon fuels. 3,893,808, Cl. 23-253.0TP.

Campbell, Robert E.; and Watson, Richard D., to General Motors Corporation. Ignition distributor for rotary internal combustion engines. 3,894,202, Cl. 200-19.00R.

Canadian Patents & Development Limited: *See—*
Stephens, Roger, 3,893,768.

Candor, James T. Method for removing and/or separating particles from fluid containing the same. 3,893,898, Cl. 204-180.00R.

Canevari, Gerard P., to Exxon Research and Engineering Company. Method and apparatus for the treatment of tar sand froth. 3,893,907, Cl. 208-11.000.

Canino, Lawrence S., to MCA Disco-Vision, Inc. Head height control system. 3,894,180, Cl. 178-6.60R.

Cannon, Robert L.: *See—*
Goldberg, Herbert E.; and Cannon, Robert L., 3,893,453.

Canon Kabushiki Kaisha: *See—*
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Capitol Products Corporation: *See—*
Cribben, James T., 3,893,261.

Cappell, Charles W., to Emerson Electric Co. Spiral winding apparatus. 3,893,324, Cl. 72-143.000.

Carbine, Joseph C.; and Wojtowicz, Edward A., to Burroughs Corporation. Rotary device to control operations in an incrementally controlled metering system. 3,893,594, Cl. 222-76.000.

Cardwell, Paul H.; Kane, William S.; and Olander, James A., to Deepsea Ventures, Inc. Nickel-cobalt separation from aqueous solutions. 3,894,139, Cl. 423-24.000.

Carella, Richard F.: *See—*
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Cargotrol Corporation: *See—*
Lewis, Dean F.; and Pinney, Vearne D., 3,893,399.

Carhart, Homer W.; Fielding, G. H.; and Gann, R. G., to United States of America, Navy. Suppression of fires in confined spaces by pressurization. 3,893,514, Cl. 169-46.000.

Carl Freudenberg, Firma: *See—*
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Carondelet Foundry Company: *See—*
Culling, John H., 3,893,851.

Carroll, Albert W.; and Sizer, Phillip S., to Otis Engineering Corporation. Method and apparatus for controlling flow from wells. 3,893,512, Cl. 166-315.000.

Carter, Merle Francis: *See—*
Hutton, James Cameron; Carter, Merle Francis; and Rowlands, Kenneth Charles, 3,893,370.

Cartun, Walter P., to Emhart Corporation. Insulated staple and method of making the same. 3,894,174, Cl. 174-159.000.

Casady, Chris D. Rotating platform elevator. 3,893,576, Cl. 214-75.00R.

Casey, James F., to Raymond Lee Organization, Inc., The, a part interest. Ironing board. 3,893,401, Cl. 108-129.000.

Casler, Mary C. Animal comb. 3,893,424, Cl. 119-83.000.

Cassella Farbwerke Mainkur Akt.: *See—*
Stachel, Adolf, deceased; Stachel, Lydia Katharina, heiress; Beyerle, Rudi; Kunze, Wilhelm; Nitz, Rolf-Eberhard; and Scholtholt, Josef, 3,894,015.

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Catoleum Pty. Limited: *See—*
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CAW Industries, Inc.: *See—*
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Cecere, Andrew P.: *See—*
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Celanese Corporation: *See—*
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Cellarius, Hans Joerg: *See—*
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Centre de Recherche Industrielle du Quebec: *See—*
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Chamberlain, James D.: *See—*
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Chandler, William R.; Cooper, Donald R.; and Mangold, Edward J., to Skagit Corporation. Pull-ahead winch control system. 3,893,404, Cl. 115-7.000.

Chandrasekaran, Swayambu, to Allied Chemical Corporation. Modified hexa fluoroisobutylene/vinylidene fluoride copolymers having improved processing characteristics. 3,893,987, Cl. 260-80.770.

Chang, Clarence D.; and Silvestri, Anthony J., to Mobil Oil Corporation. Conversion of synthesis gas to gasoline. 3,894,102, Cl. 260-668.00R.

Chang, Clarence D.; Silvestri, Anthony J.; and Smith, Robert L., to Mobil Oil Corporation. Aromatization reactions. 3,894,103, Cl. 260-668.00R.

Chang, Clarence D.; Lang, William H.; and Silvestri, Anthony J., to Mobil Oil Corporation. Aromatization of hetero-atom substituted hydrocarbons. 3,894,104, Cl. 260-668.00R.

Chang, Clarence D.; Silvestri, Anthony J.; and Smith, Robert L., to Mobil Oil Corporation. Production of durene. 3,894,105, Cl. 260-668.00R.

Chang, Clarence D.; Lang, William H.; and Silvestri, Anthony J., to Mobil Oil Corporation. Conversion of ethers. 3,894,106, Cl. 260-668.00R.

Chao, Albert L. Tape-lamps. 3,894,225, Cl. 240-1.00R.

Chapman, William A.; and Crowley, John J., to United States Envelope Company. Envelope fastener attaching machine. 3,893,381, Cl. 93-61.00B.

Charkoudian, John C., to Polaroid Corporation. Photographic ligand for inducing disproportionation of silver +1 and processes of use thereof. 3,893,855, Cl. 96-3.000.

Chartet, Andre, to Societe Anonyme des Usines Chausson. Jig for brazing elongated heat exchangers. 3,893,611, Cl. 228-44.100.

Chase, Marston. Adhesive picture mount. 3,893,252, Cl. 40-158.00R.

Cheatwood, Lowell K., to Jess & Lowell Well Casing Co. Guide device for plastic tube extrusion. 3,893,465, Cl. 134-122.000.

Chemfix Inc.: *See—*
Opacic, Donald J.; Lengyel, Arpad L.; Zawadzki, Edward A.; and Jackson, Fred H., 3,893,656.

Chemical Construction Corporation: *See—*
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Cherenko, Joseph; Harrison, Raymond P.; Kelly, Joseph D.; and Frey, William I., to PPG Industries, Inc. Method for casting resins. 3,894,024, Cl. 264-261.000.

Chevron Research Company: *See—*
Bacskai, Robert; and Wilkes, John B., 3,894,115.

Chiavaroli, Henry T., II: *See—*
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Chika, John J. Automatically deployed occupant restraint system. 3,893,703, Cl. 280-150.00B.
Chilman, John Alfred: *See—*
Keenan, John Gregory; Chilman, John Alfred; and Brooking, Ivor Harold, 3,893,783.
Choate, Gary E.; and Dugan, Larry Mason, to Coors Container Company. Method and apparatus for curing inks on metal containers by ultra violet light. 3,894,237, Cl. 250-453.000.
Chore-Time Equipment, Inc.: *See—*
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Christian, Edward F.: *See—*
Compton, Peter J.; Moline, Sheldon W.; McKenzie, Robert E.; and Christian, Edward F., 3,893,258.
Christoph, Geert; Radlmann, Eduard; and Nischk, Gunther, to Bayer Aktiengesellschaft. High molecular weight linear polyamides from araliphatic diamines. 3,893,975, Cl. 260-47.0CZ.
Christopoulos, John; and Mishcon, Lester, to Singer Company, The. Bridging cam for limiting the position of welt needles in a knitting machine. 3,893,309, Cl. 66-40.000.
Chrysler Corporation: *See—*
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Chu, Daniel Tim-Wo; and Garmaise, David Lyon, to Abbott Laboratories. Anilino derivatives of chelocardin. 3,894,061, Cl. 260-397.70R.
Chudoba, Peter, to Robert Bosch G.m.b.H. Magneto ignition system for internal combustion engines. 3,893,439, Cl. 123-149.00R.
Ciba-Geigy AG: *See—*
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Cities Service Company: *See—*
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Cizinsky, Bedrich, to Universita Karlova. Device for heating of instruments particularly for sterilization. 3,893,807, Cl. 21-82.00R.
CJB Development Limited: *See—*
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Clark Equipment Company: *See—*
Sisson, Ronald L.; Dreves, Philip J.; Shellberg, James E.; and Zeller, Burton S., 3,893,345.
Stevens, Daryl W., 3,893,580.
Clarke, Robin, to Davy-Loewy Limited (formerly Davy and United Engineering Co.). Eccentricity correction in a rolling mill. 3,893,317, Cl. 72-20.000.
Class, Jean, to Les Ateliers de Constructions Mecaniques C. & A. Holweg S.A. Bag-making machine. 3,893,884, Cl. 156-498.000.
Cleveland, Earl J., to Universal Oil Products Company. Water washing method for borate removal in an aromatic alkylation process. 3,894,090, Cl. 260-671.00R.
Cobarg, Claus Christian; and Kliegel, Walter, to Braun Aktiengesellschaft. Mirror with adjustable focal distance. 3,893,755, Cl. 350-295.000.
Cobb, Sanford, Jr., to Minnesota Mining and Manufacturing Company. Light control device. 3,894,228, Cl. 240-46.310.
Cobbledick-Kibbe Glass Company: *See—*
Allen, Donald D., 3,893,705.
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Codrino, Giuseppe. Device for the electrical connection between a flexible band-like conductor and the end contacts of an electrical energy utilizing apparatus. 3,893,745, Cl. 339-244.00R.
Cohen, Yehuda. Kit particularly useful for mounting percussion instruments to a stand. 3,893,363, Cl. 84-402.000.
Coherent Radiation: *See—*
Rorden, Robert J.; and Williams, Gerald Hunter, 3,894,230.
Coleman, Kelly R. Spaced frame construction. 3,893,251, Cl. 40-130.00R.
Colgate-Palmolive Company: *See—*
Bahouth, Tayseer George, deceased; and Bahouth, Zaher, administrator, 3,894,147.
Drukker, Alexander E., 3,894,001.
Irvine, John L., 3,894,008.
Jamois, Gerard; and Bluntz, Sylvain, 3,893,609.
Karami, Hamzeh, 3,893,460.
Suh, John T., 3,894,051.
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Combustion Engineering, Inc.: *See—*
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Commercial Solvents Corporation: *See—*
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Compton, Peter J.; Moline, Sheldon W.; McKenzie, Robert E.; and Christian, Edward F., to Union Carbide Corporation. Method for growing celery transplants. 3,893,258, Cl. 47-58.000.
Compucorp: *See—*
Bottles, David M., 3,894,216.
Computron, Inc.: *See—*
MacFarland, Raymond W., Jr., 3,894,282.
Conder International Limited: *See—*
Brown, David James, 3,893,276.
Connell, Joseph A., to NRG Incorporated. External combustion engine and engine cycle. 3,893,300, Cl. 60-683.000.
Conner, Algie J.; Dudych, Daniel; and Vermilion, Willas L., to Universal Oil Products Company. Regeneration apparatus with external regenerated-catalyst recycle means. 3,893,812, Cl. 23-288.00B.
Consolidated International Corporation: *See—*
Nineberg, Edward, 3,893,259.
Constant, Albert. Building panels. 3,893,277, Cl. 52-630.000.
Continental Can Company, Inc.: *See—*
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Continental Oil Company: *See—*
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Cook, Gerald H., to Polaroid Corporation. Method of manufacturing apparatus actuating photographic film. 3,893,880, Cl. 156-211.000.
Cooper, David J.; and Weisbach, Jerry A., to SmithKline Corporation. Pseudodisaccharide intermediates. 3,893,997, Cl. 260-210.00R.
Cooper, Donald R.: *See—*
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Birell, Peter Leslie, 3,893,599.
Morgan, Lawrence M., 3,893,686.
Cornell, Robert J.; and Vitale, Louis, to Dynamic Form Systems, Inc. Bag holder. 3,893,649, Cl. 248-99.000.
Corson, Rayard R., to Hughes Aircraft Company. No-crossover electron gun. 3,894,261, Cl. 313-449.000.
Cortez, Douglas H.: *See—*
Hutchinson, Arthur J. L.; and Cortez, Douglas H., 3,893,299.
Coste, Angelo C., to Universal Oil Products Company. Iso-thermal absorption column. 3,894,133, Cl. 261-153.000.
Cotton, George Albert. Variable ratio transmission trains. 3,893,352, Cl. 74-768.000.
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Figueroa, David R.; Doty, Edward Neal; and Marino, Anthony, 3,894,221.
Fulwyler, Mack J.; Ziffer, Garret Francis; Paquette, Gerard Adelard; and Gilmore, Michael Thomas, 3,893,767.
Hogg, Walter R., 3,893,766.
Coulter, Glenn A.; and Coulter, Thomas L. Device for latching containers. 3,893,725, Cl. 292-258.000.
Coulter, Thomas L.: *See—*
Coulter, Glenn A.; and Coulter, Thomas L., 3,893,725.
Cowpland, Michael C. J.; and Matthews, Terrence H. Audio frequency signalling systems for telephone systems. 3,894,197, Cl. 179-81.000.
Cox, Ernest P. Tree thinning and reducing machine. 3,893,633, Cl. 241-101.700.
Cox, Francis Morgan; Chamberlain, James D.; Shrader, Erwin F.; Shoffner, Bruce M.; and Szalanczy, Andras, to Kewanee Oil Company. Laminated dosimetric card. 3,894,238, Cl. 250-484.000.
Cox, James E.: *See—*
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Creators Limited: *See—*
Stent, Vernon Denis, 3,893,349.
Crew, Wynn D., to Microtech Press Inc. Off-axis viewing apparatus. 3,893,759, Cl. 353-79.000.
Cribben, James T., to Capitol Products Corporation. Window safety latch. 3,893,261, Cl. 49-449.000.
Cripe, Maxwell L.; and Rosback, Richard H., to Bendix Corporation, The. Push rod bearing and seal means. 3,893,379, Cl. 92-94.000.

Cronfel, Ramsey L. Filtered throttling valve. 3,893,927, Cl. 210-418.000.

Crosfield Electronics Limited: *See—*
Pugsley, Peter C., 3,894,178.

Croswell, Thomas L., Jr., to Croswell, Thomas L., Jr. Airplane wing camber control. 3,893,639, Cl. 244-44.000.

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Crystal Technology, Inc.: *See—*
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Curry, Walter J. Device for making lap joints for plastic film and the like. 3,893,212, Cl. 24-243.00K.

Curtiss-Wright Corporation: *See—*
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Da Costa, Nicholas Mario: *See—*
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Dahl, Eugene L., to Horton Manufacturing Co. Clutch and brake with interlock valves. 3,893,552, Cl. 192-12.00C.

Daicel Ltd.: *See—*
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Jones, Ronnie G.; and Daly, John P., 3,893,835.

D'Amato, Ralph James, to RCA Corporation. Cathode-ray tube screening correction lens with a non-solarizing material. 3,893,750, Cl. 350-189.000.

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Dana, Alfred, III. Illuminated soles and heels. 3,893,247, Cl. 36-2.50K.

Dana Corporation: *See—*
Lech, Ted, Jr.; and Waldhelm, Christian M., 3,893,556.

Dandl, John E. Variable width earth surface treating apparatus. 3,893,283, Cl. 56-6.000.

Danford, Jack D.: *See—*
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Danford, Jack De Wayne, to Danford, Jack D.; and Champlin, H. H. Grain storage and shipping containers and method of using the same. 3,893,244, Cl. 34-19.000.

Daniel, Leonard. Method of forming collagen dispersions. 3,894,132, Cl. 264-138.000.

Dantlgraber, Jorg; and Schrodt, Rudolf, to P.I.V. Antrieb Werner Reimers KG. Control device for a motor and an infinitely variable cone-pulley gear. 3,893,344, Cl. 74-230.17F.

Darms, Roland: *See—*
Lohmann, Dieter; Furrer, Peter; Darms, Roland; and Greber, Gerd, 3,894,114.

Data Systems, Inc.: *See—*
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Dauba, Jean-Louis: *See—*
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Davidson, David M., deceased: *See—*
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Davies, Terrence Ardern; Douglas, Peter; and Pedder, David John, to Square D Company. Cu-[Ag]-CdO electric contact materials. 3,893,820, Cl. 29-182.500.

Davies, Terrence Ardern; and Swallow, Peter John, to Square D Company. Silver electrical contact materials containing $La_{1-x}Sr_xCrO_3$. 3,893,821, Cl. 29-182.500.

Davis, James L.; Lopke, Edward L.; and Pechous, Leslie Joseph, to General Motors Corporation. Gas turbine fuel control. 3,893,291, Cl. 60-39.28T.

Davis, Meredith Reese, to Otis Elevator Company. Apparatus and method for suspending elevator guide rails. 3,893,219, Cl. 29-429.000.

Davis, Paul; and Shore, David N., to Sweetheart Plastics, Inc. Vertical stacker. 3,893,567, Cl. 206-520.000.

Davy-Loewy Limited (formerly Davy and United Engineering Co.): *See—*
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Dayton-Walther Corporation: *See—*
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De Benneville, Peter L., to Rohm and Haas Company. N-acylated peptides of amino aromatic sulfonic acids and their derivatives. 3,893,992, Cl. 260-112.500.

DEC International, Inc.: *See—*
Schnitzler, James J.; Schluckbier, Gary W.; and Krueger, Paul E., 3,893,422.

Decicom Systems, Inc.: *See—*
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Deep Oil Technology, Inc.: *See—*
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Deepsea Ventures, Inc.: *See—*
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Dehnert, Jurgen; Kleemann, Axel; Lussling, Theodor; Noll, Ewald; Schaefer, Hans; and Schreyer, Gerd, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Distillation of 1,2-unsaturated carboxylic acids in solution with selected amines. 3,893,895, Cl. 203-59.000.

De Jong, Robert, to Rockwell International Corporation. Circuit for initalizing logic following power turn on. 3,894,247, Cl. 307-208.000.

De Kalb, Edward L.; and Fassel, Velmer A., to United States of America, Energy Research and Development Administration. Activated phosphors having matrices of yttrium-transition metal compound. 3,893,939, Cl. 252-301.40P.

Deli, Jack M.; and Macarus, William P., to International Harvester Company. Slide ball joints and bulldozer frame employing same. 3,893,519, Cl. 172-803.000.

Dell, M. Benjamin; Haupin, Warren E.; and Russell, Allen S., to Aluminum Company of America. Electrolytic cell for metal production. 3,893,899, Cl. 204-244.000.

Dellian, Kurt A.; and Lee, Samuel, to Ciba-Geigy Corporation. Process for dyeing synthetic fibers employing naphthyl dye assistants. 3,893,805, Cl. 8-173.000.

Demetrescu, Mihai C., to Resonance Motors, Inc. Rotary engine with rotating cylinders. 3,893,433, Cl. 123-45.00A.

Deml, Reinhold: *See—*
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Denker, James M., to Nutron Corporation. Cams. 3,893,874, Cl. 148-12.100.

Dennison Manufacturing Company: *See—*
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Denzel, Horst: *See—*
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Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. Derivatives of 1,7-dihydro-2H-pyrazolo[4',3':5,6]pyrido[4,3-D]pyrimidine-2,4-(3H)-diones. 3,894,021, Cl. 260-256.40F.

De Palma, James J.; and Van Kerkhove, Alan P., to Eastman Kodak Company. Low scintillation, multi-component projection screen. 3,893,748, Cl. 350-128.000.

Deproux, Jacques Roland, to Honeywell Information Systems Inc. Printer with rectilinear type-carrying belt. 3,893,390, Cl. 101-111.000.

De Regnaucourt, Robert A., to Dayton-Walther Corporation. Tire carrying rim. 3,893,688, Cl. 301-12.00R.

Derose, Ralph A.; Rigazio, Anthony W.; and Zimmerman, George V., to Neptune International Corporation. Tamper-proof case for meter or register. 3,893,586, Cl. 220-324.000.

Derrick, Arthur Percy, to Catoleum Pty. Limited. Composition of matter and process. 3,893,847, Cl. 75-3.000.

Desilets, Kenneth G., to McCord Corporation. Two-tone painting of flexible urethane foam automobile exterior parts. 3,893,727, Cl. 293-71.00R.

DeSoto, Inc.: *See—*
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Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
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Di/An Controls, Inc.: *See—*
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Diehr, Helmut Heinrich Walter, to GTE International Incorporated. Cradle switch for telephone apparatus having self-aligning, pivoted contact assembly. 3,894,203, Cl. 200-6.00R.

Diener, Rudolf, to Autoelektronik AG. Capacitor ignition device for internal combustion engines. 3,893,438, Cl. 123-148.00E.

Diesel Kiki Kabushiki Kaisha: *See—*
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Dieterich, Dieter: *See—*
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Digital Communications, Inc.: *See—*
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Digital Data Systems, Inc.: *See—*
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Dinnerstein, Albert J., to Metaframe Corporation. Aquarium and method of forming the same. 3,893,421, Cl. 119-5.000.

Dismukes, John Pickett; and Kane, James, to RCA Corporation. Chemical vapor deposition of luminescent films. 3,894,164, Cl. 427-70.000.

Ditlinger, Richard J., to Bendix Corporation, The. Flexible coupling. 3,893,788, Cl. 416-134.000.

Dittmann, Walter: *See—*
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Dixon Automatic Tool, Inc.: *See—*
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Dixon, Leonard Fox: *See—*
Vellins, Cyril Eric; Dixon, Leonard Fox; and Hinchliffe, Bryan Ronald, 3,893,801.

Dixon, Paul H., to Dixon Automatic Tool, Inc. Mechanism for unloading parts from a machine. 3,893,358, Cl. 83-82.000.

Doane, DeWitt H., to Doane Manufacturing Company. Grease extractor for kitchen ventilating systems. 3,893,831, Cl. 55-242.000.

Doane Manufacturing Company: *See—*
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Dolan, Terry M.; and Leedy, Michael G., to United States of America, Navy. Leakage test system. 3,893,332, Cl. 73-40.000.

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Domenico, Penelope B., to Dow Chemical Company, The. Bis-(thioalkylthio cyanato)halo pyridines. 3,894,035, Cl. 260-294.80G.

Domscha, Christian: *See—*
Oberlander, Karl-Oskar; Domscha, Christian; and Schurr, Werner, 3,893,326.

Donnici, Kenneth Li, to Avom Inc. Sound-and-picture-on-film reproducing system. 3,893,757, Cl. 352-78.00R.

Dooley, James Linville, to McCulloch Corporation. Automatic decompression valve to facilitate starting of an internal combustion engine. 3,893,440, Cl. 123-182.000.

Dorr-Oliver Incorporated: *See—*
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Dosen, Masasi: *See—*
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Dower, Ethell J.; Cain, Lester L.; and Smith, Hubert Irvin, to Drill-Au-Mation, Inc. Drilling control transfer systems. 3,893,525, Cl. 175-24.000.

Dowty Rotol Limited: *See—*
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Dragoco Spezialfabrik Konz. Reich-und Aromastoffe Gerberding & Co. GmbH: *See—*
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Dravo Corporation: *See—*
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Drazick, Herman J. Ejector accelerator for molding apparatus. 3,893,644, Cl. 249-68.000.

Drehman, Lewis E., to Phillips Petroleum Company. Catalytic dehydrogenation process. 3,894,110, Cl. 260-680.00R.

Dreves, Philip J.: *See—*
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Drill-Au-Mation, Inc.: *See—*
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Drukker, Alexander E., to Colgate-Palmolive Company. 11-Aminoalkyl- and 11-cyclicaminomorphanthridines. 3,894,001, Cl. 260-239.00D.

Drummond, Arthur, Jr., to Xerox Corporation. Magnetic brush support member. 3,893,815, Cl. 29-132.000.

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Dunbar, Glenn G. Hydraulic line assembly. 3,893,480, Cl. 137-615.000.

Dunlap, William J.; and Lanier, Carroll W., to Ethyl Corporation. Recovery of pentahydrate trisodium salt of carboxymethoxy succinic acid from aqueous solution. 3,894,081, Cl. 260-535.00P.

Dunmyer, Kent W. Mobile device. 3,893,700, Cl. 280-79.100.

du Pont de Nemours, E. I., and Company: *See—*
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Durall Tool Corporation: *See—*
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Durand, Herve; and Grandjean, Theo. Pressure transmission device. 3,893,451, Cl. 128-2.05D.

Durden, John A., Jr., to Union Carbide Corporation. Carbamate pesticidal compositions. 3,894,150, Cl. 424-246.000.

Dursch, Walter; and Linke, Fritz, to Hoechst Aktiengesellschaft. Phosphorus compounds containing amide groups. 3,894,122, Cl. 260-928.000.

Dygos, John H., to G. D. Searle & Co. 2-Oxygenated 5-(1,2,3,4-tetrahydro-6-methoxy-2-naphthyl)-1-methylcyclopentaneacetic acid and salts, esters, and a lactone thereof. 3,894,053, Cl. 260-343.300.

Dynair Limited: *See—*
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Dynamic Form Systems, Inc.: *See—*
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E. R. A. Patents Limited: *See—*
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Ott, Howard F., 3,893,763.
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Moran, Thomas M.; and Paskert, Joseph H., 3,894,130.
Urban, John A.; and Hopkins, Gary L., 3,893,696.

Ebukuro, Rinzou; and Isono, Tomoyuki, to Nippon Electric Company, Limited. Device for discriminating color coded articles. 3,894,217, Cl. 235-61.11E.

Echelberger, Larry M.: *See—*
Argabright, Perry A.; Echelberger, Larry M.; and Phillips, Brian L., 3,893,916.

Ecker, Richard E., to Vitose Corporation. Process for enhancing the energy metabolism of an athlete. 3,894,148, Cl. 424-180.000.

Eckerle, William A., to General Electric Company. Compactor having improved cabinet structure. 3,893,387, Cl. 100-229.00A.

Edelman, Seymour; Roth, Steven C.; and Vezzetti, Carol F., to United States of America, Navy. Polymeric transducer array. 3,894,243, Cl. 307-88.0ET.

Edkins, Denis Pierpont: *See—*
Hull, Thomas Neil, Jr.; and Edkins, Denis Pierpont, 3,893,640.

Edmond, James J., to Bendix Corporation, The. System and method for automatic insertion of pins in holes. 3,893,217, Cl. 29-407.000.

Edstrom, Nils Herbert; Lindqvist, Stig Gustaf Wilhelm; and Sparrendahl, Erik William, to Telefonaktiebolaget L M Ericsson. Method of operating file gates in an exchange for PCM words. 3,894,189, Cl. 179-15.0AT.

Effland, Richard C., to American Hoechst Corporation. Tetrahydrobenzofuranylphenoxycarboxylic acids, esters. 3,894,057, Cl. 260-346.20R.

Effland, Richard C.; and Agnew, Marc N., to American Hoechst Corporation. Tetrahydrobenzofuranylphenoxypropylamines. 3,894,058, Cl. 260-346.20R.

Ehnstrom, Lars Karl Johan; and Sviestins, Zigurds, to Alfa-Laval AB. Method for mashing. 3,894,156, Cl. 426-29.000.

Eibl, Erich, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Continuous casting plant. 3,893,503, Cl. 164-282.000.

Eichorn, Roger H., deceased (by Rochester, Lincoln First Bank of, executor), to Xerox Corporation. Development and cleaning apparatus for reverse path machine. 3,893,416, Cl. 118-637.000.

Eidelberg, Jonah; and Mooney, Thomas. Liquid-tight swivel adaptor for electrical connector. 3,893,719, Cl. 285-55.000.

Eiland, Ehrlich M., to Aluminum Company of America. Oxalic acid treatment of foil. 3,893,872, Cl. 148-6.14A.

Eisai Co., Ltd.: *See—*
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Electronique Marcel Dassault: *See—*
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Electrothermal Engineering Limited: *See—*
Acres, Alan Birt, 3,893,341.

Elkhart Brass Manufacturing Co., Inc.: *See—*
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Finch, Wilton C.; and Eller, David C., 3,893,806.

Elliot, Frederick Cartmer; and Hunn, Reginald Arthur. Telephone cable filling composition. 3,893,839, Cl. 106-272.000.

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Wilkinson, Brian; Jibb, David John; and Smith, Martin Neil, 3,894,292.

Elm, Donald C.; and Stinn, Allan J., to Timesavers, Inc. Vertical abrasive belt type surface grinder. 3,893,265, Cl. 51-143.000.

Elmer, Arthur Ernest Henry, to Dynair Limited. Rotary fans. 3,893,555, Cl. 192-58.00B.

Elphingstone, Eugene A.; McLaughlin, Homer C.; and Smith, Charles W., to Halliburton Company. Emulsion method of introducing polymers into a subterranean formation. 3,893,510, Cl. 166-295.000.

Emerson Electric Co.: *See—*
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Emery Industries, Inc.: *See—*
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Emhart Corporation: *See—*
Cartun, Walter P., 3,894,174.

Engdahl, Rodney A.: *See—*
Barney, Harry E., Jr.; and Engdahl, Rodney A., 3,894,160.

Engdahl, Victor E. Auxiliary fuel tank. 3,893,678, Cl. 280-5.00A.

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Engelhard Minerals & Chemicals Corporation: *See—*
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Engelking, Frederick S., to Caterpillar Tractor Co. High pressure hydraulic fitting. 3,893,487, Cl. 138-89.000.

Engineering Specialties, Inc.: *See—*
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England, William G., to Bretford Manufacturing, Inc. Locking device for a multi-drawer cabinet. 3,893,740, Cl. 312-216.000.

Eppich, Alfred: *See—*
Kluge, Karl-Heinz; and Eppich, Alfred, 3,894,167.

Ericson, Ronald H.: *See—*
Burness, Donald M.; Ling, Hans G.; and Ericson, Ronald H., 3,893,859.

Ertl, John P. Method and apparatus for brain waveform examination. 3,893,450, Cl. 128-2.10B.

ESB Incorporated: *See—*
Manning, Michael R., 3,893,462.

Esch, Richard E., to C. L. Frost & Son, Inc. Track assembly for snowmobiles. 3,893,526, Cl. 180-5.00R.

Eschenmoser, Albert, to Ciba-Geigy Corporation. New 2-halo nitrones, their manufacture and their use for the manufacture of N-substituted araliphatic aldehyde-nitrones. 3,894,085, Cl. 260-566.00R.

ESCO Manufacturing Company: *See—*
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Esper, Michael J.: *See—*
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Esquire, Inc.: *See—*
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Estradier, Francoise: *See—*
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Ethyl Corporation: *See—*
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Evans, John C., Jr.; and Brandhorst, Henry W., Jr., to United States of America, General Counsel-Code GP. High power laser apparatus and system. 3,894,289, Cl. 330-4.300.

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Ewald, Ronald F. Low delivery rate valve. 3,893,597, Cl. 222-402.220.

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Fairbairn, Thomas E., to Sirius Corporation. Nozzle for energy beam system. 3,894,209, Cl. 219-121.00P.

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Farha, Floyd E., Jr.; Johnson, Marvin M.; and Tabler, Donald C., to Phillips Petroleum Company. Catalytic oxidative dehydrogenation of alkenes or alkadienes to furan compounds. 3,894,055, Cl. 260-346.10R.

Farona, Michael F.; and White, James F., to University of Akron, The. Method for reacting organic halides. 3,894,089, Cl. 260-591.000.

Farrell, Eugene A., to Frink Sno-Plows. Blade rotating, blade tripping and shock absorbing hydraulic cylinder for scraper-type snow plows. 3,893,518, Cl. 172-794.000.

Farrell, John J., to Farrell Patent Company. Molding apparatus with temperature compensating core rods. 3,893,793, Cl. 425-242.00B.

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Fassel, Velmer A.: *See—*
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Fatt, Irving, to University of California, The Regents of the. Noninvasively measuring arterial oxygen tension. 3,893,444, Cl. 128-2.00E.

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Favret, Uncas, Jr., to Engineering Specialties, Inc. Method for separating material leaving a well. 3,893,918, Cl. 210-84.000.

Federal-Mogul Corporation: *See—*
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Federal Paper Board Company, Inc.: *See—*
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Fedorov, Nikolai Alexandrovich; Butenko, Leonid Andreevich; and Kazak, Vadim Vladimirovich. Radial-swaging machine. 3,893,327, Cl. 72-402.000.

Fekete, Lajos F.; and Peetoom, Frank, to Baxter Laboratories, Inc. Clarification of blood serum and plasma using a block copolymer of ethylene oxide and polyoxypropylene. 3,893,990, Cl. 260-112.00B.

Fekete, Lajos F.; and Peetoom, Frans, to Baxter Laboratories, Inc. Clarification of blood serum and plasma using block copolymers of ethylene oxide and polyoxypropylene. 3,893,991, Cl. 260-112.00B.

Fenske, Ellsworth R.; and Anderson, Robert F., to Universal Oil Products Company. Fluid catalytic cracking process with improved propylene recovery. 3,893,905, Cl. 208-103.000.

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Ferro Manufacturing Corporation: *See—*
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Fertl, Walter H.; and Zuvanich, Paul J., to Continental Oil Company. Method of determining redox potential. 3,893,522, Cl. 175-50.000.

Fiecchi, Alberto, to Bioresearch S.a.s. Salt of S-adenosil-L-methionine and process of preparation. 3,893,999, Cl. 260-211.50R.

Fielding, G. H.: *See—*
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Figueroa, David R., to Coulter Electronics, Inc. Analog power computer. 3,894,212, Cl. 235-193.500.

Figueroa, David R.; Doty, Edward Neal; and Marino, Anthony, to Coulter Electronics, Inc. Speed up circuit in an apparatus for measuring a dividing particle size of a particulate system. 3,894,221, Cl. 235-151.300.

Finch, Wilton C.; and Eller, David C., to Burlington Industries, Inc. Method for continuous warp dyeing polyester and blends of polyester on conventional pad-steam dye slasher. 3,893,806, Cl. 8-174.000.

Firestone Tire & Rubber Company, The: *See*—
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Fisher, Chester Donald; and Fuller, Beatrice Pearl, to Sprout, Waldron & Company, Inc. Twin refiner with double floating discs. 3,893,631, Cl. 241-37.000.

Fisher, Howard M., to Pennsylvania Engineering Corporation. Multiple gas feed rotary joint for metallurgical vessels. 3,893,658, Cl. 266-36.00P.

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Fleissner, Hans, to Vepa AG. Sieve drum apparatus for the continuous treatment of lengths of textile material. 3,893,246, Cl. 34-115.000.

Fletcher, Alan T. M.; and Godsoe, Robert J., to International Business Machines Corporation. Electronic component assembly apparatus. 3,893,232, Cl. 29-626.000.

Flex-Kleen Corporation: *See*—
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Florian, Eugene F.; and Haggard, Samuel E., to Mark Products, Inc. Accelerometer. 3,893,342, Cl. 73-517.00R.

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Flower, Robert W.: *See*—
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Floyd, Grady O., to United States of America, Army. Self-orienting potentiometer. 3,893,338, Cl. 73-188.000.

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FMC Corporation: *See*—
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Foirest, Jacques; Ballin, Emile; and Favero, Guy, to Societe Anonyme dite: L'Oreal. Pneumatic device for controlling the filling of a container. 3,893,493, Cl. 141-47.000.

Fontaine, John G., to Fail Safe Brake Corporation. Brake control apparatus. 3,893,698, Cl. 303-89.000.

Food Technology, Inc.: *See*—
Glabe, Elmer F.; Anderson, Perry W.; and Laftsidis, Stergios, 3,893,842.

Forbes, Eric Simon; and Meldrum, Ian Grieg, to British Petroleum Company Limited, The. Graft copolymers of polystyrene and polyisobutylene. 3,894,119, Cl. 260-896.000.

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Foster Wheeler Corporation: *See*—
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Fracchioni, Bruno; and Villani, Guglielmo, to Massey-Ferguson Services N.V. Change speed transmissions and controls therefor. 3,893,347, Cl. 74-473.00R.

Franchi, Franco. Golf club with interchangeable heads. 3,893,670, Cl. 273-80.100.

Frank, Earl E., to Abex Corporation. Shock-protected railway crossing. 3,893,643, Cl. 246-465.000.

Franke, Kurt, to Siemens Aktiengesellschaft. X-ray diagnostic apparatus for the preparation of x-ray exposures including a timer switch for determining the exposure time. 3,894,235, Cl. 250-402.000.

Franta, Rudolf, to Rondo-Neisse Susswarenindustrie Gesellschaft m.b.H. Method for filling the cavity of an edible shell with a confectionery filling. 3,894,159, Cl. 426-284.000.

Franz, Helmut; and Lecoco, David E., to PPG Industries, Inc. Method for stabilizing a chemical filming composition. 3,893,865, Cl. 106-1.000.

Frazier, James L., to Houdaille Industries, Inc. Method and means for operating a spindle drive in a machine tool. 3,893,371, Cl. 90-11.00A.

Fredriksen, Hans P., to General Motors Corporation. Combustion liner. 3,893,296, Cl. 60-39.710.

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Frenk, J. Luis, to United States of America, Navy. Pneumatic strike-down system for projectiles. 3,893,557, Cl. 193-32.000.

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Frost, Edward G. Automatic mobile radio telephone system. 3,894,194, Cl. 179-41.00A.

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Gasbarro, Luciano, to Pratiga S.r.l. Equipment for welding glass capillary tubes for biological analyses. 3,893,837, Cl. 65-270.000.
Gassman, Paul G.; and Gruetzmacher, Gordon D., to Ohio State Research Foundation, The. A process for producing azasulfonium salts. 3,894,034, Cl. 260-294.80R.
Gassmann, Gerhard Gunter, to International Standard Electric Corporation. System for transferring wide-band sound signals. 3,894,190, Cl. 179-15.55R.
Gay, Shelton M., Jr.; and Belen, Frederick C., Jr., to United States of America, Navy. Ring-shaped hydrofoil. 3,893,403, Cl. 114-235.00B.
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Giger, Urs; Jakob, Edwin; Perrot, Friedrich; and David, Paul, to ETA A.G. Ebauches Fabrik. Watch movement with a circular movable indicator member. 3,893,289, Cl. 58-58.000.
Gilbert, Eugene C.; McLean, Donald C.; and Sherman, Edward, to Quaker Oats Company, The. Method of producing 2,2,6-trichlorocyclo-hexanone and compositions thereof. 3,894,087, Cl. 260-586.00R.
Gilbert, Robert B., to TDC Inc. Bag holder. 3,893,648, Cl. 248-97.000.
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Glenn, Thomas J., to Beckman Instruments, Inc. Optical attenuator. 3,893,753, Cl. 350-271.000.
Glewwe, Vern K. Drum dumping lift truck attachment. 3,893,579, Cl. 214-313.000.
Gloshinski, Leon J.; and Johnson, Donald R., to Cincinnati Milacron-Heald Corp. Magnetic chuck. 3,893,676, Cl. 279-1.00M.
Glover, Douglas Wade, to AMP Incorporated. Method of connecting a contact pin to laminated bus bars. 3,893,233, Cl. 29-628.000.
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Goldberg, Herbert E.; and Cannon, Robert L., to American Optical Corporation. Compressed data display system. 3,893,453, Cl. 128-2.06G.
Good, Adrian J.; and Kurek, Thaddeus P., to Valspar Corporation. Apparatus for producing polyamide esters. 3,893,811, Cl. 23-285.000.
Goodwin, Frank E. Pickup truck body and coupler for trailers. 3,893,711, Cl. 280-423.00R.
Gordon, Sidney, to R. G. Dixon & Company Limited. Floor treating machines. 3,893,530, Cl. 180-6.500.
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Grant, Philippe G. Combination kitchen table-ironing board. 3,893,400, Cl. 108-63.000.

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Gregg, Oscar P. Rotary internal combustion engine. 3,893,431, Cl. 123-8.130.

Gregoire, Clyde G. Scrap stripper for printer. 3,893,359, Cl. 83-154.000.

Gross, George E., to Illinois Tool Works Inc. Plastic screw grommet. 3,893,365, Cl. 85-80.000.

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Habermeier, Juergen; Porret, Daniel; and Leumann, Ernst, to Ciba-Geigy Corporation. Polyacrylates of isocyanurates. 3,894,016, Cl. 260-248.0NS.

Habermeier, Juergen; Batzer, Hans; and Porret, Daniel, to Ciba-Geigy AG. Hydroxyalkyl derivatives of alkylene-bis-hydantoins. 3,894,038, Cl. 260-309.500.

Hackbarth, Eugene R.; and Ward, Harry M., III, to Outboard Marine Corporation. Die castable centrifugal fan. 3,893,817, Cl. 29-156.8CF.

Hadermann, Albert F.; Waters, Paul F.; and Woo, Jung Woo. Electroosmotic pressure cell. 3,893,904, Cl. 204-301.000.

Hagelin, Karl Wilhelm, to Aktiebolaget Stille-Werner. Instrument for use in coniotomy. 3,893,454, Cl. 128-17.000.

Hagen, Elmer R.; and Hrynyk, Taras. Riding toy. 3,893,706, Cl. 280-207.000.

Hager, James R.; and Riordan, Hugh E., to Brunswick Corporation. Hall cell position sensor for outboard drive apparatus. 3,894,250, Cl. 307-309.000.

Hager, Robert Bonner; Toukan, Sameeh Said; and Walter, Gerald Joseph, to Pennwalt Corporation. Fluorine and sulfur-containing compositions. 3,893,984, Cl. 260-79.700.

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Hamrick, Oscar; and Kessinger, Orville E., Jr., to Caterpillar Tractor Co. Method for making a band brake. 3,893,225, Cl. 228-173.000.

Hamuro, Junji; and Akiyama, Masao, to Ajinomoto Co., Inc. Hydroxyalkyl and mercaptoalkyl derivatives of β-(1 3) glucans. 3,893,996, Cl. 260-209.00R.

Hanai, Kenichi; and Fukumura, Tsukasa, to Nippon Kinzoku Co. Ltd.; and Teikoku Piston Ring Co. Ltd. Method for manufacturing spheroidal graphite cast iron. 3,893,873, Cl. 148-12.00R.

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Hansen, Charles D., Jr., to AMF Incorporated. Tobacco leaf handling and distributing apparatus. 3,893,563, Cl. 198-45.000.

Hansen, Quinten A. Overload release clutch. 3,893,553, Cl. 192-56.00R.

Hanson, James M., to General Electric Company. Photoflash lamp array having means for preventing electrical shorting. 3,894,226, Cl. 240-1.300.

Hardtmann, Goetz E., to Sandoz, Inc. Tetracyclic quinazolinones and quinazolinium salts. 3,894,022, Cl. 260-256.40F.

Harris, Roger Elwin. Apparatus for shearing sheet material. 3,893,361, Cl. 83-375.000.

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Hazelrigg, Wayne K. Device for irradiating fluids. 3,894,236, Cl. 250-435.000.

Hebb, Edwin E., Jr.; and Baugh, Edward D., to General Motors Corporation. Tamper resistant engine governor. 3,893,441, Cl. 123-195.00C.

Hederich, Volker; Dieterich, Dieter; Reiff, Helmut; and Gehrke, Gunter, to Bayer Aktiengesellschaft. Anthraquinone compounds. 3,894,060, Cl. 260-380.000.

Hein, Allyn J.; and Tribley, Gilbert, to Caterpillar Tractor Co. Axial piston hydraulic device with forced lubrication means. 3,893,375, Cl. 91-486.000.

Heitman, Richard E.; Martin, Peter G.; Norris, Richard C.; and Arciprete, Genio R., to Arthur D. Little, Inc. Word processor having selectively printed data block address codes. 3,893,560, Cl. 197-19.000.

Helling, Oscar D., to GTO Enterprises, Inc. Electrical power converting apparatus. 3,894,242, Cl. 307-10.00R.
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Hewitt, Delbert C. Double acting fluid cylinder. 3,893,378, Cl. 92-88.000.
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Hocq, Robert, to Societe Franco-Hispano-Americaine (FRANCISPAM). Abrasive wheels for cigarette lighters and method of making same. 3,893,799, Cl. 431-274.000.
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Hogg, Walter R., to Coulter Electronics, Inc. Apparatus for orienting generally flat particles for slit-scan photometry. 3,893,766, Cl. 356-36.000.
Hogue, Maurice A.; McClain, James E.; and Scott, Howard L., to ESCO Manufacturing Company. Automatically responsive stored energy mechanism for opening and closing an electrical switch. 3,894,245, Cl. 307-124.000.
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Holopainen, Vaino J. Material handling apparatus. 3,893,728, Cl. 296-65.00R.
Holt, Brian; Randell, Donald Richard; and Jack, James, to Ciba-Geigy Corporation. Acyl hydrazones of 2,2,6,6-tetramethylpiperidine-4-ones. 3,893,972, Cl. 260-45.80N.
Holther, Grover P., Jr., to Racine Federated, Inc. Electric motor power unit. 3,894,254, Cl. 310-66.000.
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Janssen, Paul Adriaan Jan; Wijngaarden, Ineke Van; and Soudijn, Willem, to Janssen Pharmaceutica N.V. 1-[1-(2-Hydroxy-3-aryloxypropyl)-4-piperidyl]-2-benzimidazolinones and related compounds. 3,894,030, Cl. 260-293.600.

Janssen, Peter Johannes Michiel, to U.S. Philips Corporation. Linear stepping motor using two retaining electromagnets and a deformable electromagnet. 3,894,276, Cl. 318-135.000.

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Keenan, John Gregory; Chilman, John Alfred; and Brooking, Ivor Harold, to Dowty Rotol Limited. Gas turbine engines and bladed rotors therefor. 3,893,783, Cl. 415-129.000.

Keijzer, Johan H.; and Maes, Gerry O. Vehicle suspension system. 3,893,702, Cl. 280-124.00F.

Kelley, George S., to Boeing Company, The. Dual cycle fan jet engine for stol aircraft with augmentor wings. 3,893,638, Cl. 244-12.00D.

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Khcheyan, Khachik Egorovich; Yakovich, Ninel Iosifovna; Kotelnikova, Larisa Borisovna; Pavlichev, Alexei Fedorovich; and Zhilnina, Nina Nikolaevna. Catalyst of reducing-dehydrating type for synthesizing vinylaromatic compounds and method of preparing it. 3,893,948, Cl. 252-440.000.

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Kilmer, Earl E., to United States of America, Navy. End coupler for heat resistant mild detonating fuse. 3,893,395, Cl. 102-27.00R.

Kimberly-Clark Corporation: *See—*
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King, Dale A., to Burns-Biotec Laboratories, Inc. Transfer packaging for biologicals. 3,893,280, Cl. 53-37.000.

King, John: *See—*
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King, Robert E., Jr.; and Turner, Clifford B., to United Aircraft Corporation. Forging apparatus. 3,893,318, Cl. 72-38.000.

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Kishino, Shigeo; Kudamatsu, Akio; and Shiokawa, Kozo, to Bayer Aktiengesellschaft. O-Alkyl-S,S-di-(substituted-alkyl)-phosphorodithiolates. 3,894,123, Cl. 260-941.000.

Kishino, Shigeo; Kudamatsu, Akio; and Sumi, Shozo, to Bayer Aktiengesellschaft. S-alkoxyethyl-phenyl-di- and -tri- thiophosphonic acid esters. 3,894,124, Cl. 260-949.000.

Kita, Yuzo: *See—*
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Kitahara, Hitoshi: *See—*
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Klein, Erich; and Roth, Albrecht, to Dragoco Spezialfabrik Konz. Reich-und Aromastoffe Gerberding & Co. GmbH. 3-Oxabicyclo[10.3.0]pentadecene-(6), its preparation and its use as a perfuming agent. 3,893,953, Cl. 252-522.000.

Klement, Gunter; Baumann, Horst; and Scheidt, Eugen, to Henkel & Cie GmbH. Separation agent for molded polyurethane foams. 3,893,868, Cl. 106-38.240.

Kliegel, Walter: *See—*
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Klotz, Ilse Sofie Raizner nee, heiress: *See—*
Raizner, Friedrich, deceased; Onken, Ulfert; Schrader, Horst; and Wellbrock, Werner, 3,894,093.

Kluge, Karl-Heinz; and Eppich, Alfred, to F. Xavier Leipold. Decalcomania for decorating ceramic ware. 3,894,167, Cl. 428-40.000.

Knechtel, Wilhelm; Petersdorf, Gerhard; and Sandner, Winfried, to Canon Kabushiki Kaisha. Photocopying apparatus. 3,893,245, Cl. 34-95.000.

Knobloch, James O., to Standard Oil Company. Preparation of 2,5-dibromoterephthalic acid. 3,894,079, Cl. 260-515.00A.

Knoll, William A., to JO-Line Tools, Inc. Torque limit wrench. 3,893,354, Cl. 81-52.40R.

Kobayashi, Masao; Ikeda, Minoru; Yamada, Kantaro; and Ishii, Hiromichi, to Mitsubishi Rayon Company, Ltd. Catalyst composition for oxidation of butenes. 3,893,945, Cl. 252-435.000.

Kobayashi, Sanzo. Case. 3,893,313, Cl. 70-63.000.

Kobe Steel, Ltd.: *See—*
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Kodis, Robert D., to Di/An Controls, Inc. Ticket printer. 3,893,389, Cl. 101-93.070.

Koenig, Elmer A., to Sherwood Medical Industries, Inc. Syringe with needle destroying means. 3,893,608, Cl. 225-1.000.

Kogure, Motoo; Muroi, Yasuji; Miura, Kiyoyuki; and Watanabe, Motoo, to Konishiroku Photo Industry Co., Ltd. Silver halide photosensitive material. 3,893,861, Cl. 96-67.000.

Koh-I-Noor Rapidograph, Inc.: *See—*
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Sakai, Kiyoshi; Yusa, Takashi; Amemiya, Shigeo; Ito, Masaaki; Katano, Hamako; Yamazaki, Mitsuo; Sugiura, Mitsuko; Kojima, Koichi; and Sasaki, Masaaki, 3,894,009.

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Kolb, Erich, to Robert Bosch G.m.b.H. Windshield wiper. 3,893,204, Cl. 15-250.230.

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Konomi, Toshiaki; and Nohira, Hidetaka, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas recirculation system for automobile engines. 3,893,435, Cl. 123-119.00A.
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Kowalik, John J., to Continental Can Company, Inc. Child proof closure. 3,893,582, Cl. 215-221.000.
Kozawa, Akiya, to Union Carbide Corporation. Hydrogen absorbing material for electrochemical cells. 3,893,870, Cl. 136-107.000.
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Kroniger, Wilhelm, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Wheel suspension for vehicles with an elastic toe-in change. 3,893,701, Cl. 280-124.00A.
Kronseder, Hermann; and Wetter, Franz, to Kronseder, Hermann. Labeling device with an installation for marking labels. 3,893,388, Cl. 101-91.000.
Krueger, Paul E.: *See*—
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Kryter, Karl D. Method of and apparatus for aiding hearing and the like. 3,894,195, Cl. 179-107.0FD.
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Laing, Nikolaus. Device for the absorption and emission of heat. 3,893,506, Cl. 165-18.000.
Lais, Siegfried; and Reuter, Reinhold, to Schottel-Werft Josef Becker KG. Hydro-jet propulsion device for driving and controlling of watercraft. 3,893,405, Cl. 115-12.00R.
Lamel, Jerome E., to Xerox Corporation. Toner dispensing system. 3,893,408, Cl. 118-7.000.
Landauer, Franz; Beermann, Claus; Reuter, Martin; Lebkucher, Karl Heinz; and Kiesling, Hubert, to Hoechst Aktiengesellschaft. Wetting agents for alkaline baths. 3,893,937, Cl. 252-156.000.
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Ledford, Jonathan, to Raymond Lee Organization, Inc., The. Utility meter container. 3,893,584, Cl. 220-4.00B.
Lee, Robert D.; Hudock, Robert J.; and Shute, Dale I., to United States of America, National Aeronautics and Space Administration. Reference apparatus for medical ultrasonic transducer. 3,893,449, Cl. 128-2.00V.
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Levy, Jean, to Omnium Chimique Societe Anonyme. Process for the preparation of optical antipode of vincamine and new indole derivatives. 3,894,028, Cl. 260-287.00R.

Lewis, Dean F.; and Pinney, Vearne D., to Cargotrol Corporation. Dual cargo anchoring device. 3,893,399, Cl. 105-484.000.

Lewis, Robert E., to General Electric Company. Method of manufacturing capsules containing gaseous radioisotope. 3,893,278, Cl. 53-5.000.

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Liebman, Alan J.; and Chiavaroli, Henry T., II, to Xerox Corporation. Xerographic developing apparatus. 3,893,418, Cl. 118-637.000.

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Loch, Joseph Frank, to General Electric Company. Coffeemaker lid. 3,893,587, Cl. 220-356.000.

Loftfield, Richard E.; Bennett, John E.; and Cinke, John E., to Diamond Shamrock Corporation. Electrolytic sea water process. 3,893,902, Cl. 204-95.000.

Lohmann, Dieter; Furrer, Peter; Darms, Roland; and Greber, Gerd, to Ciba-Geigy Corporation. Polyamide-polyamide-acid block copolymers. 3,894,114, Cl. 260-857.0PA.

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Loukonen, Ernest W. Pulsation dampener. 3,893,485, Cl. 138-30.000.

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MacPhee, John; and Gegenheimer, Harold W., to Baldwin-Gegenheimer Corporation. Liquid mixing and distributing apparatus. 3,893,470, Cl. 137-101.270.

Madura, Francis Eli, to Amsted Industries Incorporated. Slack-free fifth wheel slider. 3,893,710, Cl. 280-407.000.

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Maggs, Richard G. Adjustable couch with acoustical head rest. 3,893,731, Cl. 297-456.000.

Mahaffey, Derek W.; and Drummond, James E., to Boeing Company, The. Method for reducing matter to constituent elements and separating one of the elements from the other elements. 3,893,845, Cl. 75-10.00R.

Mai, Gerhard; and Siepmann, Reiner, to W. C. Heraeus GmbH. Method for preparing a catalyst for the oxidative purification of exhaust gases. 3,893,950, Cl. 252-466.0PT.

Majima, Hideyasu; Mikami, Itsuo; and Kita, Yuzo, to Hitachi, Ltd. Magnetic bubble domain logical and arithmetic devices. 3,894,223, Cl. 235-175.000.

Mallory, Ray R., to United States of America, Navy. Multi-buoyancy buoy. 3,893,201, Cl. 9-8.00R.

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Manning, Michael R., to ESB Incorporated. Bioelectrochemical regenerator and stimulator devices and methods for applying electrical energy to cells and/or tissue in a living body. 3,893,462, Cl. 128-421.000.

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Marayama, Yo: *See—*
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Marcec, Ervin A. Refractory bottom ring with two flexible wiper elements. 3,893,645, Cl. 249-202.000.

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Marcillat, Roland; and Mantoux, Gerard, to Ets NICOLAS & Fils. Devices for limiting transversal leaning of vehicles. 3,893,680, Cl. 280-6.00H.

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Markem Corporation: *See—*
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Markus, Isidoro N. Thermodynamic cycle for rotary engines. 3,893,428, Cl. 123-8.110.

Marley Company, The: *See—*
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Maron, Edmund, to Aktiengesellschaft Adolph Saurer. Device for mixing and impelling of heat-exchange fluids. 3,893,785, Cl. 415-157.000.

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Marsh, William S., to Factory Mutual Research Corporation. Discharge head and fire protection system utilizing said head. 3,893,513, Cl. 169-16.000.

Marshall, Leonard; and Hobday, David S., to E. R. A. Patents Limited. Vehicle guidance system operating in the bang bang mode. 3,893,536, Cl. 180-98.000.

Martin, Peter G.: *See—*
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Matcon, Inc.: *See—*
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Mathiesen, Odd, to International Standard Electric Corporation. Time delay circuit for modems. 3,894,287, Cl. 328-108.000.

Matsumoto, Shuzo; and Hirota, Ryoichi, to Hitachi, Ltd. Convergence correction device. 3,894,267, Cl. 315-368.000.

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Maul Brothers Inc.: *See—*
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Maulding, Donald Roy, to American Cyanamid Company. Chlorinated glycolide. 3,894,050, Cl. 260-340.200.

Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lothar; Behrenz, Wolfgang; Hammann, Ingeborg; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. 3,4,-Dihydro-4-oxo-quinazolin (3)-yl-(thiono)-phosphoric (phosphonic) acid esters. 3,894,020, Cl. 260-251.00P.

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May, William E.; and Netzel, Philip C., to I-T-E Imperial Corporation. 38KV low current fused switch. 3,894,204, Cl. 200-50.0AA.

Mayer, Alfred; and Scwartzman, Stanley, to RCA Corporation. Megasonic cleaning system. 3,893,869, Cl. 134-86.000.

Mayer, Arthur, to Astrosystems, Inc. Precision two-phase electron oscillator employing an all-pass network having means for adjusting its time constant as a function of the amplitude of the oscillating voltage. 3,894,291, Cl. 331-45.000.

Mayer, Endre A., to Bendix Corporation, The. Dual single action ram intensifier. 3,893,790, Cl. 417-346.000.

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McCloskey, Albert R., to Rockwell International Corporation. Self-adjusting bearing. 3,893,736, Cl. 308-72.000.

McCollum, James A., to Alsons Corporation. Spray head. 3,893,628, Cl. 239-521.000.

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McCormick, Thomas W., to FMC Corporation. Canopy assembly for a dual boom drill. 3,893,520, Cl. 173-34.000.

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McNally, Aubrey D. Male retaining device. 3,893,455, Cl. 128-79.000.

McNeil Laboratories, Incorporated: *See—*
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Melone, Robert Richard, to Illinois Tool Works Inc. Liquid level indicator. 3,893,339, Cl. 73-327.000.

Melton, Rosser B., Jr.; and Hubbard, Elbert M., to Southwest Research Institute. System for injecting particulate material into the combustion chamber of a repetitive combustion coating apparatus. 3,893,578, Cl. 214-305.000.

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Mertzweiller, Joseph Z.; and Tenney, Horace M., to Exxon Research and Engineering Company. Catalyst for hydrogenation of organic compounds. 3,893,944, Cl. 252-431.00C.

Meschino, Joseph Albert, to McNeil Laboratories, Incorporated. α-Aminomethyl-hydrocinnamonitriles. 3,894,072, Cl. 260-465.00E.

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Metailler, Roger, to Ford Motor Company. Cable flex limiting device. 3,893,571, Cl. 212-117.000.

Metcalf, Robert L.; Kapoor, Inder; and Hirwe, Asha, to University of Illinois Foundation. P,P'-Disubstituted alpha-trichloromethylbenzyl ethers. 3,894,092, Cl. 260-613.00R.

Mew, James T. Fish stringer. 3,893,605, Cl. 224-7.00D.

Meyer, Arnfried. Drum-type machine for the treatment of textile material. 3,893,311, Cl. 68-143.000.

Meyers, George Leroy, to American Can Company. Tamperproof reclosable carton. 3,893,614, Cl. 229-51.0TC.

Meyers, Robert E., to Bendix Corporation, The. Accumulator with temperature compensation. 3,893,486, Cl. 138-31.000.

Michalski, Raymond J.; and Cochrane, Chappelle C., to Nalco Chemical Company. Foam inhibiting composition. 3,893,941, Cl. 252-358.000.

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Miller, Albert T., to Devro, Inc. Manufacture of edible collagen casings using liquid smoke. 3,894,158, Cl. 426-277.000.

Miller, Darrow L., to Rockwell International Corporation. Acoustical damping structure and method of preparation. 3,894,169, Cl. 428-425.000.

Miller, Peter S. Abdominal catheter and support combination for opaque medium fluids. 3,893,446, Cl. 128-2.00A.

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Mims, Bruce L., to Branson Instruments, Incorporated. High frequency vibratory spot welding of sheet metal. 3,893,223, Cl. 228-110.000.

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Miwa, Haruo; Hasegawa, Yasushi; Mori, Toyoshi; and Iwase, Yoshitaka, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Electric motor with means for magnetically preventing axial vibration. 3,894,252, Cl. 310-51.000.

Mixon, Donald E.; and Stewart, Dan F., to Phillips Petroleum Company. Foamed and oriented blends of low density polyethylene and polypropylene. 3,893,957, Cl. 260-2.5HA.

Miya, Bunji, to Kao Soap Co., Ltd. Process for production of tetrahydrofuran. 3,894,054, Cl. 260-346.10R.

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Moebius, Kurt O. Constrictor ring joint. 3,893,720, Cl. 285-187.000.

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Moran, Thomas M.; and Paskert, Joseph H., to Eaton Corporation. Method for producing self retaining knob. 3,894,130, Cl. 264-25.000.

Moreiras, Luis; and Patel, Hiralal V., to Weatherhead Company, The. Flareless fitting. 3,893,716, Cl. 285-3.000.

Morgan, Lawrence M., to Cornelius Company, The. Collapsible cart. 3,893,686, Cl. 280-36.00R.

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Morner, Bengt; and Wallin, Bengt. Portable cutting-off implement. 3,893,240, Cl. 30-390.000.

Moroney, Richard D., to Theradyne Corporation. Bearing assembly for wheelchair structures. 3,893,708, Cl. 280-242.0WC.

Morozowich, Walter, to Upjohn Company, The. Substituted phenyl and naphthyl esters of PGE_2. 3,894,062, Cl. 260-395.000.

Morris, Ervin E. Refuse bag holder. 3,893,699, Cl. 280-34.00B.

Morrison, Gary N.; and Ward, Stanley Roger. Automobile arm rest tape holder. 3,893,585, Cl. 220-22.600.

Morrison, Ralph; and O'Dea, Orrin B., to Communication Mfg. Co. Current flow test apparatus. 3,894,284, Cl. 324-28.00R.

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Mott-Smith, Lewis M., to Petty-Ray Geophysical, Inc. Multiple air gun array of varied sizes with individual secondary oscillation suppression. 3,893,539, Cl. 181-115.000.
Mouri, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Signal generator. 3,894,229, Cl. 250-199.000.
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Nack, Ronald L. Fish hook snelling tool. 3,893,254, Cl. 43-1.000.
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Nelson, Norman A., to Putch, Samuel W., a part interest. Well casing hanger assembly. 3,893,717, Cl. 285-3.000.
Nelsson, Nels; and Wendt, Alan C., to United States Gypsum Company. Curbed walls comprising pairs of planar panels and studs therefore. 3,893,269, Cl. 52-65.000.
Nemet, Josef, to Reaktorbau Forschungs- und Baugesellschaft m.b.H. & Co. OHG. Pressure vessel. 3,893,508, Cl. 165-136.000.
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Newton, George C., Jr. Synchronous machine for stepping motor and other applications and method of operating same. 3,894,255, Cl. 310-80.000.
Nifco Inc.: *See—*
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Nippon Electric Company, Limited: *See—*
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Nitz, Rolf-Eberhard: *See—*
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Ono, Shoji; Kitamura, Ikuo; Kuramoto, Tomoko; Taguchi, Keizaburo; and Yoshizaki, Tomozo, to Nisshin Flour Milling Co., Ltd. Process for the preparation of a frozen dough for bakery products. 3,894,155, Cl. 426-25.000.

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Ott, Howard F., to Eastman Kodak Company. Liquid gate for individual film frame printing. 3,893,763, Cl. 355-52.000.

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Pagel, Warren C., to Minnesota Mining and Manufacturing Company. Bonding film. 3,894,113, Cl. 260-836.000.

Palfy, Christa Ursula. Tricot crochet fabric and its method of manufacture. 3,893,310, Cl. 66-169.00R.

Pallos, Ferenc M., to Stauffer Chemical Company. Halogenated esters as herbicide antidotes. 3,893,838, Cl. 71-100.000.

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Parker, Robert, to RPR, Inc. Thermally insulated thermometer. 3,893,340, Cl. 73-356.000.

Parkinson, David B., to Gould Inc. Machine for making expanded metal. 3,893,214, Cl. 29-6.200.

Paroussiadis, Demitri. Tube compressor. 3,893,590, Cl. 222-103.000.

Parsons, Joseph L. Occupant propelled roundabout. 3,893,666, Cl. 272-33.00B.

Parsons, Michael Edward: *See—*
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Pei, Jack Chia Kai; and Kitahara, Hitoshi, to Fuji Xerox Co., Ltd. Plural reflector, single speed uni-directional scanning device. 3,893,764, Cl. 355-66.000.

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Petersen, Alfred W.; and Stewart, John M., to Stauffer Chemical Company. Co-current absorber for recovering inorganic compounds from plant effluents. 3,893,830, Cl. 55-236.000.

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Pfeiffer, Hans C.; and Woodard, Ollie C., to International Business Machines Corporation. Method and apparatus for aligning electron beams. 3,894,271, Cl. 315-384.000.

Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H., to Syntex (U.S.A.) Inc. Disubstituted xanthone carboxylic acid compounds. 3,894,049, Cl. 260-335.000.

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Pietzsch, Siegfried; and Schaffer, Georg, to Hoechst Aktiengesellschaft. Process for isolating arylhydroxy compounds. 3,894,095, Cl. 260-620.000.

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Plom, Paul, to Hutchinson-Mapa. Sealing joints for curtain walls. 3,893,272, Cl. 52-235.000.

Pochitaloff-Huvale, Leonid; and Domboy, Alexandre, to Pochitaloff-Huvale, Leonid. Method and a device for the underwater construction of concrete structures. 3,893,304, Cl. 61-46.000.

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Preston, Thomas A. Pacing apparatus and method utilizing improved catheter. 3,893,461, Cl. 128-419.00P.

Prevorsek, Dusan Ciril; Kwon, Young Doo; Butler, Russell Howard; and Sharma, Raj Kumar, to Allied Chemical Corporation. Method and apparatus for determining sidewall temperature in running tires. 3,893,331, Cl. 73-15.600.

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Richter, Sidney B.; and Krenzer, John, to Velsicol Chemical Corporation. Dithiepanyl anilids. 3,894,048, Cl. 260-327.00M.

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Ricoh Co., Ltd.: *See—*
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Roes, Antonius Albertus. Straightening equipment. 3,893,329, Cl. 72-457.000.

Rogers, Philip A.; Hesse, Jack E.; and Ferraro, Joseph P., to Johns-Manville Corporation. Corrosion resistant gel coating lining for composite plastic pipe. 3,893,488, Cl. 138-141.000.

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Rosenberry, George Mowry, Jr., to General Electric Company. Electric motor transient voltage suppressing circuit. 3,894,274, Cl. 317-13.00R.

Ross, Richard T., to Scott Paper Company. Packaging system including removable moisture-impervious sealing sheet. 3,893,566, Cl. 206-498.000.

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Rossi, Harry J., deceased (by Rossi, Evelyn A., executrix); and Arneson, Edwin L., to Federal Paper Board Company, Inc. Bottle Carrier. 3,893,565, Cl. 206-183.000.

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Sakakibara, Naoji, to Aisin Seiki Kabushiki Kaisha. Apparatus for control of a vehicle constant speed mechanism. 3,893,537, Cl. 180-105.00E.

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Sanchez, Hector J.; and Tates, Donald W., to Xerox Corporation. Reverse buckle sheet feeding apparatus. 3,893,663, Cl. 271-21.000.

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Schmidt, Horst. Inner lining construction for impact crushers. 3,893,634, Cl. 241-182.000.

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Scholl, Albert S. Butt seam cutting tool. 3,893,238, Cl. 30-294.000.

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Scholz, Donald T., to Polaroid Corporation. Sound motion picture processing and projection system. 3,893,756, Cl. 352-29.000.

Schonher, Theodore R. Golf club. 3,893,672, Cl. 273-167.00A.

Schonstedt, Erick O., to Schonstedt Instrument Company. Magnetic locator including sensors mounted in longitudinal grooves of a tubular support. 3,894,283, Cl. 324-3.000.

Schonstedt Instrument Company: *See—*
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Schottel-Werft Josef Becker KG: *See—*
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Schreyer, Gerd: *See—*
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Schrodt, Rudolf: *See—*
Dantlgraber, Jorg; and Schrodt, Rudolf, 3,893,344.

Schroeter, Joachim W., to Buffalo Forge Company. Hub-to-shaft connection. 3,893,779, Cl. 403-370.000.

Schuller, Rolf, to Koh-I-Noor Rapidograph, Inc. Lettering template. 3,893,243, Cl. 33-174.00G.

Schultz, Robert L.: *See—*
Armbruster, Melvin L.; Campanale, Anthony O.; and Schultz, Robert L., 3,893,282.

Schulz, Harry: *See—*
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Schulze, Ernst: *See—*
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Schupack, Morris; and van der Poll, Andres. Pressure vessel. 3,893,270, Cl. 52-80.000.

Schurr, Werner: *See—*
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Schuster, David A., to General Motors Corporation. Manually controlled regulator valve with exhaust control. 3,893,472, Cl. 137-116.300.

Schwarze, Werner: *See—*
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Schweicher, Wolfgang: *See—*
Herzhoff, Peter; Gref, Hans; Maus, Fritz; Schweicher, Wolfgang; Frenken, Hans; Browatzki, Kurt; Voss, Karl; Wasser, Willi; and Bubmann, Heinrich, 3,893,410.

Schweizer, Gottfried, to Gertsch AG. Safety ski binding. 3,893,684, Cl. 280-11.35T.

SCM Corporation: *See—*
Nadkarni, Anil V., 3,893,844.

Scott, Howard L.: *See—*
Hogue, Maurice A.; McClain, James E.; and Scott, Howard L., 3,894,245.

Scott Paper Company: *See—*
Ross, Richard T., 3,893,566.

Scovill Manufacturing Company: *See—*
Stroh, William Sylvester, 3,893,476.

Scwartzman, Stanley: *See—*
Mayer, Alfred; and Scwartzman, Stanley, 3,893,869.

Seale-Finch, Vernon, to Plessey Handel und Investments A.G. Recording and/or play back apparatus. 3,893,637, Cl. 242-206.000.

Sealfire: *See—*
Geffroy, Robert, 3,893,675.

Sears, Roebuck and Co.: *See—*
Bloomfield, Alan M., 3,894,281.

Secrist, John A., III; Barrio, Jorge R.; Leonard, Nelson J.; and Dammann, Laurence G., to University of Illinois Foundation. Fluorescent derivatives of cytosine-containing compounds. 3,893,998, Cl. 260-211.50R.

Sedivy, Stanley J., to Zenith Radio Corporation. Color selection electrode suspension system with bimetal structures having orthogonal deflection components. 3,894,260, Cl. 313-405.000.

See, Gary G., to Addressograph Multigraph Corporation. Platen alignment control. 3,893,393, Cl. 101-269.000.

Seeley, Ann M.; and McKibben, H. Eldon, to Seeley, Ann M. Asparagus snapper. 3,893,285, Cl. 56-327.00A.

Seitetsu Kagaku Co., Ltd.: *See—*
Hirao, Shoichi; Ihara, Satoshi; and Ueda, Kanji, 3,894,128.

Sellstedt, John H.: *See—*
Teller, Daniel M.; and Sellstedt, John H., 3,894,010.

Selvaratnam, Thillyampalam, to Petrocarbon Developments Limited. Process for the oxidation of olefines. 3,894,059, Cl. 260-348.600.

Selvidge, Charles W., to Universal Oil Products Company. Fuel oil production by blending hydrodesulfurized vacuum gas oil and hydrodesulfurized deasphalted residuum. 3,893,909, Cl. 208-211.000.

Sentementes, Thomas J.: *See—*
Hough, Harold L.; Audesse, Emery G.; and Sentementes, Thomas J., 3,893,797.

Servais, Donald A. Window escapes. 3,893,541, Cl. 182-73.000.

Sewing, Gerhard; and Bachor, Jurgen, to Paul Hettich & Co. Hinge for a piece of furniture. 3,893,209, Cl. 24-164.000.

Seymour, Donald Edwin; and Da Costa, Nicholas Mario, to Hydron Limited. Copolymers of alkoxy and hydroxy alkyl methacrylates and a process for their preparation. 3,893,988, Cl. 260-86.10E.

Shannon, John Martin; and Ralph, John Ernest, to U.S. Philips Corporation. Solid state image display and/or conversion device. 3,894,295, Cl. 357-19.000.

Sharma, Raj Kumar: *See—*
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Shellberg, James E.: *See—*
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Shenoha, James: *See—*
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Shepard, Kenneth L.: *See—*
Cragoe, Edward J., Jr.; Shepard, Kenneth L.; and Woltersdorf, Otto W., Jr., 3,894,065.

Sheppard, Ronald J., to du Pont de Nemours, E. I., and Company. Acrylic coating composition for finishing flexible substrates. 3,893,960, Cl. 260-23.0AR.

Sherman, Edward: *See—*
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Sherman, Gale K.; and Smith, Guy A., to McDonnell Douglas Corporation. Convertible passenger seat. 3,893,729, Cl. 297-118.000.

Sherwood Medical Industries, Inc.: *See—*
Koenig, Elmer A., 3,893,608.

Shibata, Shinichi; and Saeki, Takashi, to Tokyo Shibaura Electric Co., Ltd. Circuit for comparing at least two input signals to generate control signals. 3,894,187, Cl. 179-1.0HF.

Shibayama, Kimio; and Sato, Hiroaki, to Shibayama, Kimio. Elastic surface wave transducer. 3,894,251, Cl. 310-9.800.

Shibuya, Yoichi: *See—*
Yano, Takashi; Shibuya, Yoichi; Kanda, Satoshi; and Umeda, Shin, 3,893,360.

Shieh, Tsu-Chia: *See—*
Aronoff, Elihu J.; Dhami, Kewal Singh; and Shieh, Tsu-Chia, 3,894,118.

Shields, Walter A. Liquid gravity feed system. 3,893,600, Cl. 222-529.000.

Shiga, Shujiro; Morimoto, Masayoshi; Horiike, Hideki; Hirai, Mikio; and Higashio, Yasuhiko, to Sumitomo Chemical Co., Ltd. Thermoplastic resin composition having high impact and weather resistance. 3,893,968, Cl. 260-33.6AQ.

Shigeta, Tadao: *See—*
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Shikuma, Haruo: *See—*
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Shiokawa, Kozo: *See—*
Kishino, Shigeo; Kudamatsu, Akio; and Shiokawa, Kozo, 3,894,123.

Shoemaker, Arthur H., to American Optical Corporation. 40X Microscope objective. 3,893,751, Cl. 350-229.000.

Shoffner, Bruce M.: *See—*
Cox, Francis Morgan; Chamberlain, James D.; Shrader, Erwin F.; Shoffner, Bruce M.; and Szalanczy, Andras, 3,894,238.

Sholtz, Mitchell D., to Bowmar Instrument Corporation. Bearing assembly for dynamoelectric machine. 3,894,256, Cl. 310-90.000.

Shore, David N.: *See—*
Davis, Paul; and Shore, David N., 3,893,567.

Shrader, Erwin F.: *See—*
Cox, Francis Morgan; Chamberlain, James D.; Shrader, Erwin F.; Shoffner, Bruce M.; and Szalanczy, Andras, 3,894,238.

Shute, Dale I.: *See—*
Lee, Robert D.; Hudock, Robert J.; and Shute, Dale I., 3,893,449.

Shute, George A.; and Zimmer, Richard A., to Data Systems, Inc. Surface friction testing. 3,893,330, Cl. 73-9.000.

Sibatani, Juichi; Itou, Sadayoshi; Yamamoto, Masachika; and Nakagawa, Mithuhiko, to Sumitomo Electric Industries, Ltd.; and Toyota Motor Co., Ltd. Resilient structure for disc brake friction pad. 3,893,543, Cl. 188-1.00A.

Siczek, Bernard W.; and Hall, Gene H., to Graco Inc. Electric airless cup gun apparatus. 3,893,627, Cl. 239-332.000.

Siebert, Sidney A.: *See—*
Young, Richard W.; and Siebert, Sidney A., 3,894,211.

Siemens Aktiengesellschaft: *See—*
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Siems, Lee E., to Digital Data Systems, Inc. Apparatus for suppressing noise spikes. 3,894,222, Cl. 235-151.300.

Siepmann, Reiner: *See—*
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Sierracin Corporation, The: *See—*
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Sieurin, Sven Ivar, to Granges Essem Aktiebolag. Method for separating metal which accompanies slag skimmed from a bath of molten metal, and a device for carrying out the method. 3,893,657, Cl. 266-37.000.

Sievers, David L.; Hipsher, Gary L.; and Vosburgh, Robert, to General Tire & Rubber Company, The. Resilient bushing with long fatigue life. 3,893,775, Cl. 403-225.000.

Silresim Chemical Corporation: *See—*
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Silver, Alexander; and Friedericy, Johan A., to Garrett Corporation, The. Foil bearing arrangements. 3,893,733, Cl. 308-9.000.

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Chang, Clarence D.; Silvestri, Anthony J.; and Smith, Robert L., 3,894,103.
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Chang, Clarence D.; Silvestri, Anthony J.; and Smith, Robert L., 3,894,105.
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Simer Pump Company: *See—*
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Simich, Emil, to A. J. Gerrard and Company. Bale tie straightening apparatus. 3,893,316, Cl. 72-2.000.

Simmons, Bjorn Herman Olof, to Aktiebolaget Bofors. Parachute-borne flare device. 3,893,396, Cl. 102-35.000.

Simmons, Ray A.: *See—*
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Singer Company, The: *See—*
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Sirius Corporation: *See—*
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Sizer, Phillip S.: *See—*
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Skagit Corporation: *See—*
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SKF Industrial Trading and Development Company, B.V.: *See—*
Brenner, Adolf, 3,893,735.

Skinner, Edward Albert, to Aerpat A.G. Stud-and-socket fastener. 3,893,211, Cl. 24-221.00K.

Skinner, Raymond O. Garment carrying aid. 3,893,604, Cl. 224-5.00N.

Skoyles, Derek Robert, to U.S. Philips Corporation. Anti-lock control valve including a displaceable flow-measuring piston. 3,893,693, Cl. 303-21.00F.

Slamar, Frank, to United States Steel Corporation. Method and mechanism for indicating mold friction in a continuous-casting machine. 3,893,502, Cl. 164-4.000.

Slimak, Lawrence E.: *See—*
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Slowig, Walter D.: *See—*
Brown, Barry M.; and Slowig, Walter D., 3,894,166.

Sloyan, Jerome J. Oscillation absorbing motor base. 3,893,646, Cl. 248-23.000.

Small, Michael P.; and Cox, James E., to Heyer-Schulte Corporation, by said James E. Cox. Penile prosthesis. 3,893,456, Cl. 128-79.000.

Smeltz, Karen M.: *See—*
Allcock, Harry R.; Smeltz, Karen M.; and Mack, Daniel P., 3,893,980.

Smith, Arthur J. Pneumatic device for driving headed objects. 3,893,610, Cl. 227-8.000.

Smith, Charles W.: *See—*
Elphingstone, Eugene A.; McLaughlin, Homer C.; and Smith, Charles W., 3,893,510.

Smith, Gordon Arthur; and Stephens, Robert George, to National Research Development Corporation. Methods and apparatus for alternating-current arc welding. 3,894,210, Cl. 219-131.00R.

Smith, Guy A.: *See—*
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Smith, Hubert Irvin: *See—*
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Smith, Martin Neil: *See—*
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Smith, Ralph E.; and Kozoman, Frank E., to Duke University Inc. Method for rapid harvesting of roller culture supernatant fluid. 3,893,887, Cl. 195-1.700.

Smith, Richard H. Floating solar pool heater. 3,893,443, Cl. 126-271.000.

Smith, Robert L.: *See—*
Chang, Clarence D.; Silvestri, Anthony J.; and Smith, Robert L., 3,894,103.
Chang, Clarence D.; Silvestri, Anthony J.; and Smith, Robert L., 3,894,105.

Smith, Theodore M., to Smith, Lucille G., trustee; and Smith, Theodore M., trustee. Quick change spindle adapter for tool holder. 3,893,677, Cl. 279-75.000.

Smith, Theodore M., trustee: *See—*
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Smithers, James P., to Armour and Company. Machine for packaging materials. 3,893,281, Cl. 53-123.000.

SmithKline Corporation: *See—*
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Smiths Industries Limited: *See—*
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Snamprogetti S.p.A.: *See—*
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Snow-King Enterprises, Inc.: *See—*
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Snyder, Carl R.: *See—*
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Snyder, Owen D., Jr.; and Wilson, Cranmer W., to Hide-A-Gym International, Inc. Exercise device with combined spring tension and frictional resistance. 3,893,667, Cl. 272-58.000.

Societe Anonyme Automobiles Citroen: *See—*
Cadiou, Jean G., 3,893,260.

Societe Anonyme des Usines Chausson: *See—*
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Societe Anonyme dite: L'Oreal: *See—*
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Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 3,893,802.

Societe d'Optique, Precision Electronique et Mechanique - Sopelem: *See—*
Ferray, Michael, 3,893,749.

Societe Franco-Hispano-Americaine (FRANCISPAM): *See—*
Hocq, Robert, 3,893,799.

Sohar, Paul; and Schoenewaldt, Erwin F., to Merck & Co., Inc. Production of thebaine. 3,894,026, Cl. 260-285.000.

Sohar, Paul; and Schoenewaldt, Erwin F., to Merck & Co., Inc. Resolution of racemic reticuline and racemization of its enantiomers. 3,894,027, Cl. 260-286.00R.

Solberg, Bjorn Ragnar, to International Standard Electric Corporation. Failure detecting system for devices employing digital parallel-to-series converters. 3,893,617, Cl. 235-153.00A.

Sony Corporation: *See—*
Watanabe, Naozo; Kaneko, Kunio; and Dosen, Masasi, 3,893,875.

Sotman, Kurt: *See—*
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Soudijn, Willem: *See—*
Janssen, Paul Adriaan Jan; Wijngaarden, Ineke Van; and Soudijn, Willem, 3,894,030.

Sound Sciences Inc.: *See—*
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Southwest Research Institute: *See—*
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Souza, Jesse A., to Varian Associates. Composite ignitor and arc lamp holder assembly. 3,894,266, Cl. 315-227.000.

Sparrendahl, Erik William: *See—*
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Speech, Steven R., to Minnesota Mining and Manufacturing Co. Poly-(urethane-urea) sealants and sealing underground structures therewith. 3,894,131, Cl. 264-45.200.

Sprinter Pack AB: *See—*
Wallin, Kay Arne; Ewjen, Bengt Anders; and Nilsson, Jan Ingemar, 3,893,380.

Sprout, Waldron & Company, Inc.: *See—*
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Square D Company: *See—*
Davies, Terrence Ardern; Douglas, Peter; and Pedder, David John, 3,893,820.
Davies, Terrence Ardern; and Swallow, Peter John, 3,893,821.

Stabrylla, Robert Gordon: *See—*
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Stache, Ulrich; and Radscheit, Kurt, to Hoechst Aktiengesellschaft. Process for manufacture of β-(3-oxo-7 α-thioa cyl-17β-hydroxy-4-androstene-17α-yl) propionic acid γ-lactones. 3,894,006, Cl. 260-239.55R.

Stachel, Adolf, deceased; by Stachel, Lydia Katharina, heiress; Beyerle, Rudi; Kunze, Wilhelm; Nitz, Rolf-Eberhard; and Scholtholt, Josef, to Cassella Farbwerke Mainkur Akt. Basically substituted 1(2H)-phthalazinone derivatives. 3,894,015, Cl. 260-247.20A.

Stachel, Lydia Katharina, heiress: *See—*
Stachel, Adolf, deceased; Stachel, Lydia Katharina, heiress; Beyerle, Rudi; Kunze, Wilhelm; Nitz, Rolf-Eberhard; and Scholtholt, Josef, 3,894,015.

Stadler, Henry L.; Tien, Tseng-Ying; Esper, Michael J.; and Romine, Donald J., to Ford Motor Company. Method of manufacture of an exhaust gas sensor for an air-fuel ratio sensing system. 3,893,230, Cl. 29-592.000.

Stamicarbon, N.V.: *See—*
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Standard Oil Company: *See—*
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Standard Register Company, The: *See—*
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Standard-Thomson Corporation: *See—*
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Standifer, Robert, to North American Biologicals, Inc. Holder for a transluscent or transparent bottle containing a liquid. 3,893,495, Cl. 150-52.00R.

Stanley Denki Kabushiki Kaisha: *See—*
Teshima, Toru; Nagasao, Toshiie; Tanaka, Minoru; Ariga, Kazuo; and Takamura, Yoshiko, 3,893,900.

Stanley Works, The: *See—*
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Stapelfeldt, Heinz E.: *See—*
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Staples, Paul R., to General Electric Company. Door-locking apparatus for a cooking oven. 3,894,214, Cl. 219-394.000.

Star Dental Manufacturing Co., Inc.: *See—*
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Stauffer Chemical Company: *See—*
Pallos, Ferenc M., 3,893,838.
Petersen, Alfred W.; and Stewart, John M., 3,893,830.

Stein, Dieter; Haaf, Franz; and Illers, Karl-Heinz, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Impact-resistant thermoplastic molding material. 3,893,966, Cl. 260-30.80R.

Steiner American Corporation: *See—*
Bahnsen, Erwin B., 3,893,738.

Steinmann, Helmut, to Robert Bosch G.m.b.H. Servo aided steering system. 3,893,534, Cl. 180-79.100.

Steinstrasser, Ralf, to Merck Patent Gesellschaft mit beschrankter Haftung. 4-(Alkyl)-4'-(alkoxy or alkylcarbonyloxy)-1,1'-azobene. 3,893,994, Cl. 260-206.000.

Stendel, Wilhelm: *See—*
Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lothar; Behrenz, Wolfgang; Hammann, Ingeborg; and Stendel, Wilhelm, 3,894,020.

Stent, Vernon Denis, to Creators Limited. Steering wheel for vehicles. 3,893,349, Cl. 74-552.000.

Stepan, James Lawrence: *See—*
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Stephens, Robert George: *See—*
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Stephens, Roger, to Canadian Patents & Development Limited. Zeeman modulated spectral source. 3,893,768, Cl. 356-85.000.

Sterling, Vaughn C., to General Electric Company. Photoflash lamp. 3,893,798, Cl. 431-95.000.

Stevens, Daryl W., to Clark Equipment Company. Side and front tiltable lift truck mast. 3,893,580, Cl. 214-672.000.

Stewart, Dan F.: *See—*
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Stewart, John M.: *See—*
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Stinn, Allan J.: *See—*
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Stoll, Kurt; and Hihn, Gerhard. Connecting devices. 3,893,477, Cl. 137-614.200.

Strakeljahn, Heinz. Finishing tool. 3,893,372, Cl. 90-12.00D.

Strandberg, Torsten: *See—*
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Stroh, William Sylvester, to Scovill Manufacturing Company. Relief valve core. 3,893,476, Cl. 137-543.170.

Strohschein, Clayton B., to Raymond Lee Organization, Inc., The, a part interest. Shock absorber vehicle bumper. 3,893,726, Cl. 293-1.000.

Sturm, Elmar; Cellarius, Hans Joerg; and Vogel, Christian, to Ciba-Geigy Corporation. 1-Alkenylthis and chloroalkylthia-carbonyl)-octahydroindoles. 3,894,044, Cl. 260-326.12R.

Sturm, Elmar: *See—*
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Sturwold, Robert J.; and Barrett, Fred O., to Emery Industries, Inc. Ester lubricants suitable for use in aqueous systems. 3,893,931, Cl. 252-49.500.

Suda, Kyo: *See—*
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Sugimoto, Hisashi: *See—*
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Sugiura, Mitsuko: *See—*
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Suh, John T., to Colgate-Palmolive Company. N-methylenedioxyphenylalkyl)-β-(alkyl)-disubstituted phenethylamines. 3,894,051, Cl. 260-340.500.

Sumi, Shozo: *See—*
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Sumitomo Chemical Co., Ltd.: *See—*
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Sumitomo Electric Industries, Ltd.: *See—*
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Sibatani, Juichi; Itou, Sadayoshi; Yamamoto, Masachika; and Nakagawa, Mithuhiko, 3,893,543.

Sumrall, Howell M. Hand truck step climber. 3,893,679, Cl. 280-5.300.

Sun Oil Company: *See—*
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Sunahara, Hiroshi; Ishihara, Yutaka; and Nakayama, Noboru, to Agency of Industrial Science & Technology. Device for automatic determination of suspended solids content in water. 3,893,333, Cl. 73-61.00R.

Sundby, Bjorn; and Wixon, Harold Eugene, to Colgate-Palmolive Company. Detergent-softener compositions containing esters of dicarboxylic acids and polyhydroxy tertiary amines. 3,893,930, Cl. 252-8.800.

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Suzuki, Noboru; and Kamiya, Yozu, to Toyoda Machine Works, Limited. Automatic tool changing apparatus. 3,893,227, Cl. 29-568.000.

Svensson, Thorbjorn, to Linden-Alimak AB. Counterweight arrangement for a rack and pinion elevator. 3,893,542, Cl. 187-94.000.

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Tadokoro, Eiichi; Aonuma, Masashi; and Kitamoto, Tatsuji, to Fuji Photo Film Co., Ltd. Ferromagnetic thin films by electroplating. 3,893,824, Cl. 29-194.000.

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Takaishi, Naotake; Inamoto, Yoshiaki; and Tsuchihashi, Kiyoshi, to Kao Soap Co., Ltd. Process for preparation of 1-methyladamantane. 3,894,098, Cl. 260-666.00M.

Takaishi, Naotake; Inamoto, Yoshiaki; and Tsuchihashi, Kiyoshi, to Kao Soap Co., Ltd. Process for preparing 1-methyldamantane. 3,894,099, Cl. 260-666.00M.

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Takami, Katsumi; Shimbo, Chiaki; and Suda, Kyo, to Hitachi, Ltd. Apparatus for analysing a plurality of mixed gases. 3,893,770, Cl. 356-96.000.

Takamura, Yoshiko: *See—*
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Tamura, Masahiko; Iwama, Kiyonori; and Asahina, Mitsuo, to Pioneer Electronic Corporation. Electret electrostatic electroacoustic transducer. 3,894,199, Cl. 179-111.00E.

Tanaka, Kunio; and Fukada, Toshio, to Teijin Ltd. Preparation of indoles and catalyst compositions used in their preparation. 3,894,042, Cl. 260-319.100.

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Tassie, Douglas P., to General Electric Company. High rate of flow port for spool valves. 3,893,479, Cl. 137-625.300.

Tatem, Bemis Caldwell, Jr.; and Stabrylla, Robert Gordon, to General Electric Company. Bypass augmentation burner arrangement for a gas turbine engine. 3,893,297, Cl. 60-224.000.

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Taylor, George William Charles; and Thomas, Arwyn Theophilus. Manufacture of basic lead styphnate. 3,894,068, Cl. 260-435.00A.

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Teikoku Piston Ring Co. Ltd.: *See—*
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Tejeda, Alvaro R., to J. Vast Associates, Inc. System for softening and dealkalizing water by electrodialysis. 3,893,901, Cl. 204-301.000.

Telefonaktiebolaget L M Ericsson: *See—*
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Tetenborg, Konrad: *See—*
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Thoma, Wilhelm; Hildebrand, Dietrich; Last, Wolf-Dieter; and Rinke, Heinrich, to Bayer Aktiengesellschaft. Process for the production of basic modified polyamides. 3,893,981, Cl. 260-78.00L.

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Thompson, J. Dale, deceased; and Thompson, Dorothy B., executrix. Ground effects vehicle and an air terminal. 3,893,538, Cl. 180-117.000.

Thompson, Russell G.: *See—*
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Thomsen, Elmer R. Stock feeder for printing press. 3,893,664, Cl. 271-100.000.

Thomson-CSF: *See—*
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Todaro, Anthony. Combination tool for wire cutting and stripping. 3,893,199, Cl. 7-5.600.

Tojyo, Tsutomu, to Olympus Optical Co., Ltd. Microscope objective. 3,893,752, Cl. 350-229.000.

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Torgrim, Willard J., to Rockwell International Corporation. Clock recovering apparatus and method. 3,894,246, Cl. 307-208.000.

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Greeb, Fredrick J.; Brodie, Shepard B.; and Flatau, Carl R. Variable ratio mixed-mode bilateral master-slave control system for shuttle remote manipulator system. 3,893,573, Cl. 214-1.0CM.
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Ono, Shoji; Kitamura, Ikuo; Kuramoto, Tomoko; Taguchi, Keizaburo; and Yoshizaki, Tomozo, 3,894,155.
Young, Dean Arthur, to Union Oil Company of California. Group VI-B metal catalyst preparation. 3,893,947, Cl. 252-439.000.
Young, Lee. Snow removal apparatus. 3,893,248, Cl. 37-41.000.
Young, Richard W.; and Siebert, Sidney A., to Cabot Corporation. Method of sealing the end of a filled welding rod. 3,894,211, Cl. 219-146.000.
Yuda, Takuo, to Nifco Inc. Plastic device for spacing and holding two or more plates. 3,893,208, Cl. 24-73.00P.
Yusa, Takashi: *See—*
Sakai, Kiyoshi; Yusa, Takashi; Amemiya, Shigeo; Ito, Masaaki; Katano, Hamako; Yamazaki, Mitsuo; Sugiura, Mitsuko; Kojima, Koichi; and Sasaki, Masaaki, 3,894,009.
Zaffignani, Giovanni; and Mannocchi, Oscar, to Ing. C. Olivetti & C., S.p.A. Line control unit for teleprinters. 3,894,175, Cl. 178-2.00R.
Zahlaus, Helmut. Process for cutting reinforcing steel bars for steel concrete and a bar cutting machine for effecting the process. 3,893,357, Cl. 83-80.000.
Zahn, Willy: *See—*
Riggert, Karlheinz;; Zahn, Willy; Jantzen, Bernhard; Sander, Rolf; and Wandel, Dietmar, 3,894,135.
Zaiser, Wolfgang; and Hainmuller, Sigurd, to Daimler-Benz Aktiengesellschaft. Controllable aggregate-drive for internal combustion engines. 3,893,343, Cl. 74-230.17F.
Zaltron, Mario, to Evinger Corporation. Band making apparatus. 3,893,319, Cl. 72-49.000.

Zaugg, Roland: *See—*
Fluck, Josef; and Zaugg, Roland, 3,893,290.
Zawadzki, Edward A.: *See—*
Opacic, Donald J.; Lengyel, Arpad L.; Zawadzki, Edward A.; and Jackson, Fred H., 3,893,656.
Zdrok, Edward Z.: *See—*
Hoffman, Donald O.; and Zdrok, Edward Z., 3,894,129.
Zeffren, Eugene: *See—*
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Zeller, Burton S.: *See—*
Sisson, Ronald L.; Dreves, Philip J.; Shellberg, James E.; and Zeller, Burton S., 3,893,345.
Zemke, Hubert: *See—*
Manning, Lindley; McKee, Robert B.; Zemke, Hubert; and Douglas, Bruce M., 3,893,681.
Zenith Radio Corporation: *See—*
Briskey, Robert J., 3,894,196.
Libman, Philomena C.; and Wainscott, William E., 3,893,877.
Manske, Hans E., 3,894,270.
Sedivy, Stanley J., 3,894,260.
Zerlauth, Ferdinand, to Brown Boveri Sulzer-Turbomachinery Ltd. Apparatus for adjusting stator blades. 3,893,784, Cl. 415-149.00R.
Zhilnina, Nina Nikolaevna: *See—*
Khcheyan, Khachik Egorovich; Yakovich, Ninel Iosifovna; Kotelnikova, Larisa Borisovna; Pavlichev, Alexei Fedorovich; and Zhilnina, Nina Nikolaevna, 3,893,948.
Ziemann, Heinz; Troemel, Gerhard; and Lehmann, Wolfgang, to Bayer Aktiengesellschaft. Auxiliaries for the manufacture of paper. 3,893,885, Cl. 162-164.000.
Ziffer, Garret Francis: *See—*
Fulwyler, Mack J.; Ziffer, Garret Francis; Paquette, Gerard Adelard; and Gilmore, Michael Thomas, 3,893,767.
Zimmer Aktiengesellschaft: *See—*
Riggert, Karlheinz;; Zahn, Willy; Jantzen, Bernhard; Sander, Rolf; and Wandel, Dietmar, 3,894,135.
Zimmer, Richard A.: *See—*
Shute, George A.; and Zimmer, Richard A., 3,893,330.
Zimmerman, Abraham A., to Exxon Research and Engineering Company. Method of removing organometallic compounds from liquid hydrocarbons. 3,893,912, Cl. 208-253.000.
Zimmerman, Abraham A., to Exxon Research and Engineering Company. Method of removing organometallic compounds from liquid hydrocarbons. 3,893,913, Cl. 208-253.000.
Zimmerman, Emil F. Tool connecting apparatus for tractors. 3,893,516, Cl. 172-273.000.
Zimmerman, George V.: *See—*
Derose, Ralph A.; Rigazio, Anthony W.; and Zimmerman, George V., 3,893,586.
Zin, Gary K.: *See—*
Korostoff, Edward; and Zin, Gary K., 3,893,796.
Zinner, Hans: *See—*
Leibach, Heinrich; and Zinner, Hans, 3,893,626.
Zopfi, William L.: *See—*
Flegel, George J.; and Zopfi, William L., 3,893,919.
Zuckerman, Henryk: *See—*
Barkay, Joseph; Zuckerman, Henryk; and Pundak, Nachman, 3,893,308.
Zuvanich, Paul J.: *See—*
Fertl, Walter H.; and Zuvanich, Paul J., 3,893,522.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF JULY, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Anderson, Donald R., and A. J. Frisque, to Nalco Chemical Co. Process for rapidly dissolving water-soluble polymers. Re. 28,474, 7–8–75, Cl. 260—29.6.

Aronberg, Lester, to Lake Chemical Co. Flux for use in soldering of stainless steels Re. 28,472, 7–8–75, Cl. 148—26.

Bahn, John J.: *See*—
Coggeshall, Almy D., Bahn, Maher, and Waldbillig. Re. 28,478.

Bahn, John J., A. D. Coggeshall, R. T. Maher, and J. B. Waldbillig, to General Electric Co. Winding support system for a dynamoelectric machine. Re. 28,478, 7–8–75, Cl. 310—260.

Baumgartner, Robert G., and H. J. Graff, to Bell Telephone Laboratories, Inc. Cable shield connector. Re. 28,468, 7–8–75, Cl. 339—14.1.

Bell Telephone Laboratories, Inc.: *See*—
Baumgartner, Robert G., and Graff. Re. 28,468.

Blecke, Ronald G., and R. W. Hill, to Gulf Research & Development Co. Process for copolymerization of maleic anhydride with 1-olefins. Re. 28,475, 7–8–75, Cl. 260—78.5.

Bonnet, Jean-Loup, to Schlumberger Technology Corp. Magnetic suspension flowmeters. Re. 28,464, 7–8–75, Cl. 73—155.

Brunswick Corp.: *See*—
Webber, Harold H. Re. 28,470.

Bress, Dellason F., to Foster Wheeler Corp. Control for environmental pollution in tall oil fractionation. Re. 28,476, 7–8–75, Cl. 260—97.6.

Brindle, John H.: *See*—
Eastwood, Fred, Brindle, and Kolb. Re. 28,466.

Carl Mfg. Co., Ltd.: *See*—
Mori, Chuzo. Re. 28,463.

Chaturvedi, Mahesh C. Co-Nn-Cr base austentic alloys precipitation strengthened by intermetallic compounds and carbides. Re. 28,471, 7–8–75, Cl. 75—134.

Coggeshall, Almy D.: *See*—
Bahn, John J., Coggeshall, Maher, and Waldbillig. Re. 28,478.

Curtiss, Jack E.: *See*—
Curtiss, Frank E., and J. E. Re. 28,467.

Curtiss, Frank E., and J. E. Throwing member and pair of multiple-target area post members. Re. 28,467, 7–8–75, Cl. 273—100.

Eastwood, Fred, J. H. Brindle, F. L. Kolb, Jr., by Foseco International Ltd., assignee, to Foseco International Ltd. Hot top for big-end-up ingot molds and method of assembling same. Re. 28,466, 7–8–75, Cl. 249—201.

Foseco International Ltd.: *See*—
Eastwood, Fred, Brindle, and Kolb. Re. 28,466.

Foster Wheeler Corp.: *See*—
Bress, Dellason F. Re. 28,476.

Frisque, Alvin J.: *See*—
Anderson, Donald R., and Frisque. Re. 28,474.

General Electric Co.: *See*—
Bahn, John J., Coggeshall, Maher, and Waldbillig. Re. 28,478.

Graff, Harry J.: *See*—
Baumgartner, Robert G., and Graff. Re. 28,468.

Gulf Research & Development Co.: *See*—
Blecke, Ronald G., and Hill. Re. 28,475.

Hill, Robert W.: *See*—
Blecke, Ronald G., and Hill. Re. 28,475.

Hyodo, Masayoshi: *See*—
Suzuki, Masaru, Hyodo, and Kurihara. Re. 28,479.

Impullitti, Ector P., deceased, by Madeline Impullitti, administrator, to F. W. Means, & Co. Dry cleaning process. Re. 28,469, 7–8–75, Cl. 8—142.

Impullitti, Madeline: *See*—
Impullitti, Ector P., and Madeline. Re. 28,469.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Suzuki, Masaru, Hyodo, and Kurihara. Re. 28,479.

Kolb, Frederick L.: *See*—
Eastwood, Fred, Brindle, and Kolb. Re. 28,466.

Lake Chemical Co.: *See*—
Aronberg, Lester. Re. 28,472.

Maher, Richard T.: *See*—
Bahn, John J., Coggeshall, Maher, and Waldbillig. Re. 28,478.

Means, F. W., & Co.: *See*—
Impullitti, Ector P., and Madeline. Re. 28,469.

Mori, Chuzo, to Carl Mfg. Co., Ltd. List finder with insertable information cards. Re. 28,463, 7–8–75, Cl. 40—104.10.

Nalco Chemical Co.: *See*—
Anderson, Donald R., and Frisque. Re. 28,474.

Nelligan, William B., to Schlumberger Technology Corp. Method and apparatus for measuring neutron characteristics of a material surrounding a well bore. Re. 28,477, 7–8–75, Cl. 250—262.

Reidy, Regina. Sewing aid device for, and method of, setting a sleeve in the armhole of a bodice. Re. 28,564, 7–8–75, Cl. 223—1.

Schlumberger Technology Corp.: *See*—
Nelligan, William B. Re. 28,477.
Bonnet, Jean-Loup. Re. 28,464.

Steele, Terri G., to Western Electric Co., Inc. Primary explosive compositions for explosive bonding or forming. Re. 28,473, 7–8–75, Cl. 149—35.

Suzuki, Masaru, M. Hyodo, and Y. Kurihara, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Combination turn-signal and hazard-warning system. Re. 28,479, 7–8–75, Cl. 340—81.

Waldbillig, John B.: *See*—
Bahn, John J., Coggeshall, Maher, and Waldbillig. Re. 28,478.

Webber, Harold H., to Brunswick Corp. Porous metal structure. Re. 28,470, 7–8–75, Cl. 29—180.

Western Electric Co., Inc.: *See*—
Steele, Terri G. Re. 28,473.

LIST OF PLANT PATENTEES

Barberet, Alexandre, and H. Blanc, to Laboratoire de Physiologie Vegetale de la Londe Barberet & Blanc. Carnation plant. 3,739, 7–8–75, Cl. 73.

Blanc, Henri: *See*—
Barberet, Alexandre, and Blanc. 3,739.

Coward, Charles B., W. H. Jessel, Jr., and W. E. Duffett, to said Charles B. Coward. Chrysanthemum plant. 3,741, 7–8–75. Cl. 81.

Duffett, William E.: *See*—
Jessel, Walter H., Jr., and Duffett. 3,740.

Jessel, Walter H., Jr.: *See*—
Coward, Charles B., Jessel, and Duffett. 3,741.

Jessel, Walter H., Jr., and W. E. Duffett, to Yoder Brothers, Inc. Chrysanthemum plant. 3,740, 7–8–75, Cl. 74.

Laboratoire de Physiologie Vegetale de la Londe Barberet & Blanc: *See*—
Barberet, Alexandre, and Blanc. 3,739.

Yoder Brothers, Inc.: *See*—
Jessel, Walter H., Jr., and Duffett. 3,740.

LIST OF DESIGN PATENTEES

Abend, Chester J., J. J. Bienkowski, and E. V. B. Ludwick, to SCM Corp. Typewriter. 235,806, 7–8–75, Cl. D64—11.

Acton, Hugh C., to American Seating Co. Chair. 235,711, 7–8–75, Cl. D6—69.

Allen, Edward L., Sr., and L. C. Dental floss holder. 235,774, 7–8–75, Cl. D24—1.

Allen, Lillian C.: *See*—
Allen, Edward L., Sr., and L. C. 235,774.

Allen, William G., Jr. Surgical suture remover. 235,814, 7–8–75, Cl. D83—12.

A. L. & W. Ltd.: *See*—
Parsons, Ronald W. 235,759.

American Electromedics Corp.: *See*—
Rock, Erwin H., and Klar. 235,742.

American Screen Printing Equipment Co.: *See*—
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Applied Power, Inc.: *See*—
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Bajer Industries Inc.: *See*—
Friedberg, Marvin P. 235,797.

Balenciaga S.A.: *See*—
Dinand, Pierre F. 235,735.

Ball, Douglas C., to Massey-Ferguson Industries Ltd. Desk or similar article. 235,719, 7–8–75, Cl. D6—162.

Ball, Douglas C., to Massey-Ferguson Industries Ltd. Desk or similar article. 235,720, 7–8–75, Cl. D6—162.

Ball, Douglas C., to Massey-Ferguson Industries Ltd. Desk or similar article. 235,721, 7–8–75, Cl. D6—162.
Barr, Arthur C. Baby bottle. 235,812, 7–8–75, Cl. D83—8.
Barr, Keith. Phasing simulator for a musical instrument. 235,779, 7–8–75, Cl. D26—13.
Becker, Leo M., to Schmidt, Johnson, Hovey & William. Grain elevator. 235,770, 7–8–75, Cl. D23—2.
Bernhardt, Brian A.: *See*—
Genzel, Edward A., and Bernhardt. 235,760.
Genzel, Edward, and Bernhardt. 235,761.
Bernstein, Abraham, to Kleer-Vu Industries, Inc. Album cover or the like. 235,767, 7–8–75, Cl. D19—31.
Berry, Richard F. Boat. 235,754, 7–8–75, Cl. D12—63.
Birnie, George D., to Brunswick Corp. Disassemblable archery finger tab. 235,703, 7–8–75, Cl. D2—361.
Block Drug Co., Inc.: *See*—
Roth C. Richard. 235,813.
Blue Darter, Inc.: *See*—
Gourley, Herbert W. 235,803.
Bowen, Jack L., L. G. Fischer, and J. Ryan, to E. F. Johnson Co. Plug housing. 235,776, 7–8–75, Cl. D26—1.
Breault, James N. Coffee-tea cup rack and cabinet. 235,715, 7–8–75, Cl. D6—129.
Bremer, Harry. Boat hull. 235,753, 7–8–75, Cl. D12—62.
Brunswick Corp.: *See*—
Birnie, George D. 235,703.
Butorac, John R., to Applied Power, Inc. Road side service jack. 235,751, 7–8–75, Cl. D12—55.
Bush, George, to P.H.C. Industries, Inc. Carrying case handle. 235,730, 7–8–75, Cl. D8—154.
Burns, Dennis L. Face guard for a helmet. 235,702, 7–8–75, Cl. D2—233.
Caleco Industries, Inc.: *See*—
Zimmers, Melvin, and Gerber. 235,790.
Cann, Lyle L., to Chemetron Corp. Cryogenic freezer or similar article. 235,808, 7–8–75, Cl. D67—2.
Carleton, Kenneth A., to Spaceship Up., Inc. Cigarette holder. 235,781, 7–8–75, Cl. D27—7.
Carl Mfg. Co., Ltd.: *See*—
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Case, Cecil D., F. S. Fell, W. F. Potter, and R. J. Robbins, to Hesston Corp. Self-propelled windrower. 235,796, 7–8–75, Cl. D40—1.
Centronics Data Computer Corp.: *See*—
Fossella, Gregory 235,778.
Chemetron Corp.: *See*—
Cann, Lyle L. 235,808.
Christensen, Justin D. Bag. 235,739, 7–8–75, Cl. D9—249.
Christophel, Reuben L., to Shenandoah Mfg. Co., Inc. Poultry watering valve. 235,771, 7–8–75, Cl. D23—19.
Clark Equipment Co.: *See*—
Fuller, Narrell C., and Williamson. 235,752.
Collister, Kenneth D., and L. C. Johnson, to Miles Laboratories, Inc. Microbiological nutrient medium holder. 235,785, 7–8–75, Cl. D32—1.
Container Corp. of America: *See*—
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Martin, Roger L. 235,783.
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Dart Industries Inc.: *See*—
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Laylon, Harry. 235,712.
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Swatman, Donald R. 235,775.
Dictaphone Corp.: *See*—
Plumb, William L. 235,780.
Dinand, Pierre F., to Balenciaga S.A. Perfume bottle. 235,735, 7–8–75, Cl. D9—168.
Donner, Aaron, to The Lane Co., Inc. Bed headboard. 235,713, 7–8–75, Cl. D6—79.
Donner, Aaron, to The Lane Co., Inc. Chest. 235,716, 7–8–75, Cl. D6—154.
Donner, Aaron, to The Lane Co., Inc. Chest of drawers. 235,717, 7–8–75, Cl. D6—154.
Donner, Aaron, to The Lane Co., Inc. Dresser. 235,718, 7–8–75, Cl. D6—154.
Dowding, Hanry, to The Marbelite Co., Inc. Illuminated pedestrian signal face. 235,748, 7–8–75, Cl. D10—121.
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Strand, Gordon A., and Drow. 235,736.
Eberhardt, Agnes J. Facial exerciser. 235,788, 7–8–75, Cl. D34—5.
Eberhardt, Agnes J. Weighted facial exerciser. 235,789, 7–8–75, Cl. D34—5.
Edwards, Lawrence K. Car for elevated railway. 235,750, 7–8–75, Cl. D12—40.
England, Will C. Traffic hazard marker. 235,744, 7–8–75, Cl. D10—109.
England, Will C. Traffic hazard marker. 235,745, 7–8–75, Cl. D10—109.
England, Will C. Traffic hazard marker. 235,746, 7–8–75, Cl. D10—109.
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Famolare, Inc.: *See*—
Famolare, Joseph P., Jr. 235,701.
Famolare, Joseph P., Jr., to Famolare, Inc. Shoe sole. 235,701, 7–8–75, Cl. D2—319.
Flaherty, Danny F., and D. R. Payton, to W. R. Weaver, Co. Tray for packaging telescopic gun sights or the like. 235,738, 7–8–75, Cl. D9—240.
Forsberg, John R., and E. H. Meisner, to Helene Curtis Industries, Inc. Permanent wave heating machine. 235,815, 7–8–75, Cl. D86—10.
Fossella, Gregory, to Centronics Data Computer Corp. Printer and keyboard housing. 235,778, 7–8–75, Cl. D26—5.
Friedberg, Marvin P., to Baier Industries Inc. Bollard light fixture. 235,797, 7–8–75, Cl. D48—31.
Friedman, Benjamin, to Solitron Devices, Inc. Locket watch. 235,741, 7–8–75, Cl. D10—30.
Fuller, Narrell C., and W. A. Williamson, to Clark Equipment Co. Lift truck body. 235,752, 7–8–75, Cl. D12—61.
Game Time, Inc.: *See*—
Wormser, Robert S. 235,792.
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Genzel, Edward A., and B. A. Bernhardt. 235,760, 7–8–75, Cl. D12—162.
Genzel, Edward, and B. A. Bernhardt. Universal coupling. 235,761, 7–8–75, Cl. D12—162.
Genzel, Edward A., and B. M. Bernhardt. Universal coupling trailer hitch. 235,762, 7–8–75, Cl. D12—162.
Gerber, Gary A.: *See*—
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Gibson, Michael C.: *See*—
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Tfrzian, Rouben T., and Glass. 235,793.
Gore, Fred M. Newspaper vending machine. 235,801, 7–8–75, Cl. D52—3.
Gorman, Barbara H. Stuffed toy animal figure. 235,787, 7–8–75, Cl. D34—2.
Gourley, Herbert W., to Blue Darter, Inc. Brander for baseball bat or the like. 235,803, 7–8–75, Cl. D55—1.
Grant, Munro M. Inflatable football shoulder pad cushion. 235,699, 7–8–75, Cl. D2—27.
Gray, Gregg L. Book cover. 235,766, 7–8–75, Cl. D19—26.
Habuda, Blair A., and A. Kopatich. Beam clamp. 235,731, 7–8–75, Cl. D8—235.
Halame Co.: *See*—
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Donner, Aaron. 235,717.
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Largeteau, Jean-Pierre, to Pneumatiques Caoutchouc Manufacture et Plastiques Kleber-Colombes. Tire. 235,758, 7–8–75, Cl. D12—143.
Laylon, Harry, to Dart Industries Inc. 235,712, 7–8–75, Cl. D6—70.
Lesser, Harry, Jr., to Halame Co. Like rack for toothbrushes and toiletries or the like. 235,714, 7–8–75, Cl. D6—94.
Levahn, William L. Floor covering or similar article. 235,764, 7–8–75, Cl. D18—2.
Linger, Harrison K., to General Electric Co. Clothes scrubbing device for attachment to a washing machine lid. 235,799, 7–8–75, Cl. D49—1.
Lynn Drug Co., The: *See*—
Parson, Phillip E. 235,811.
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Maloy, Dorothy E. Slotted centerpiece figurine for napkin display and holding candles, flowers or the like. 235,784, 7–8–75, Cl. D29—23.
Marbelite Co., Inc., The: *See*—
Dowding, Hanry. 235,748.
Martin, Roger L., to Container Corp. of America. Tree ornament. 235,783, 7–8–75, Cl. D29—1.
Marvin Glass & Associates: *See*—
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Miles Laboratories, Inc.: *See*—
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Strand, Gordon A., and Drow. 235,736.
Paone, Anthony N., W. P. Montgomery, and A. C. Zeamer, to SCM Corp. Ribbon cartridge shipping tray. 235,737, 7–8–75, Cl. D9—187.
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Largeteau, Jean-Pierre. 235,758.
Procop, Alex J. Motion picture projector viewer. 235,804, 7–8–75, Cl. D61—1.
Rettick, Richard. Picture frame. 235,722, 7–8–75, Cl. D6—242.
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Becker, Leo M. 235,770.
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Abend, Chester J., Bienkowski, and Ludwick. 235,806.
Scott & Fetzer Co., The: *See*—
Williams, Clyde H. 235,726.
Senter, Jonas. Sport shoe. 235,700, 7–8–75, Cl. D2—311.
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Christophel, Reuben L. 235,771.
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Friedman, Benjamin. 235,741.
Spaceship Up., Inc.: *See*—
Carleton, Kenneth A. 235,781.
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Hall, Richard B. 235,816.
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Vorchheimer, Kurt M. Serving tray or similar article. 235,723, 7–8–75, Cl. D7—70.
Weaver, W. R., Co.: *See*—
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Williams, Clyde H., to The Scott & Fetzer Co. Canister vacuum cleaner or similar article. 235,726, 7–8–75, Cl. D7—168.
Williamson, William A.: *See*—
Fuller, Narrell C., and Williamson. 235,752.
Wormser, Robert S., to Game Time, Inc. Serpentine playground climber. 235,792, 7–8–75, Cl. D34—5.
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44 : 3,893,491
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DESIGN PATENTS

4	235,784		235,707		235,796		235,788		235,806	48	235,738
5	235,703		235,713	21	235,799		235,789		235,809		235,744
6	235,704		235,716	24	235,706		235,803		235,810		235,745
	235,715		235,717		235,774	34	235,730	39	235,727		235,746
	235,722		235,718		235,798		235,772		235,728		235,760
	235,750		235,787	25	235,756		235,791		235,729		235,761
	235,766		235,790		235,778		235,813		235,731		235,762
	235,775	12	235,699		235,786	36	235,712		235,732		235,801
	235,777		235,792	26	235,711		235,723		235,734	49	235,710
	235,781	17	235,709		235,726		235,737		235,736	51	235,771
	235,782		235,793		235,733		235,741		235,811		235,814
	235,783		235,807		235,752		235,742		235,816		
	235,794		235,808	27	235,764		235,743			53	235,702
	235,800		235,815		235,776		235,748	41	235,708		235,769
	235,802	18	235,747	29	235,714		235,767	42	235,705	55	235,751
	235,804		235,785		235,754		235,779		235,749		235,753
	235,805	20	235,739		235,755		235,780	44	235,724		235,765
9	235,700		235,763		235,770		235,797		235,725		235,812

PLANT PATENTS

12	3,741	39	3,740				

U. S. GOVERNMENT PRINTING OFFICE : O - 1975

U.S. DEPARTMENT OF COMMERCE
Rogers C. B. Morton, *Secretary*

PATENT AND TRADEMARK OFFICE
C. Marshall Dann, *Commissioner*